CONTRACT: C201512 R-2562AC

STRUCTURES

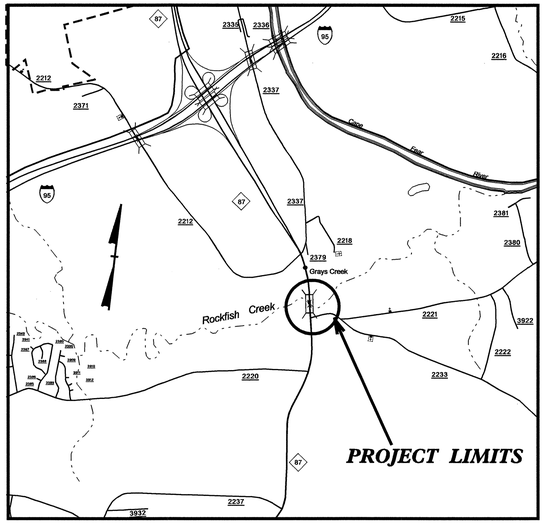
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2562AC		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34467.3.2		P.E.
34467.3.11		CONSTRUCTION

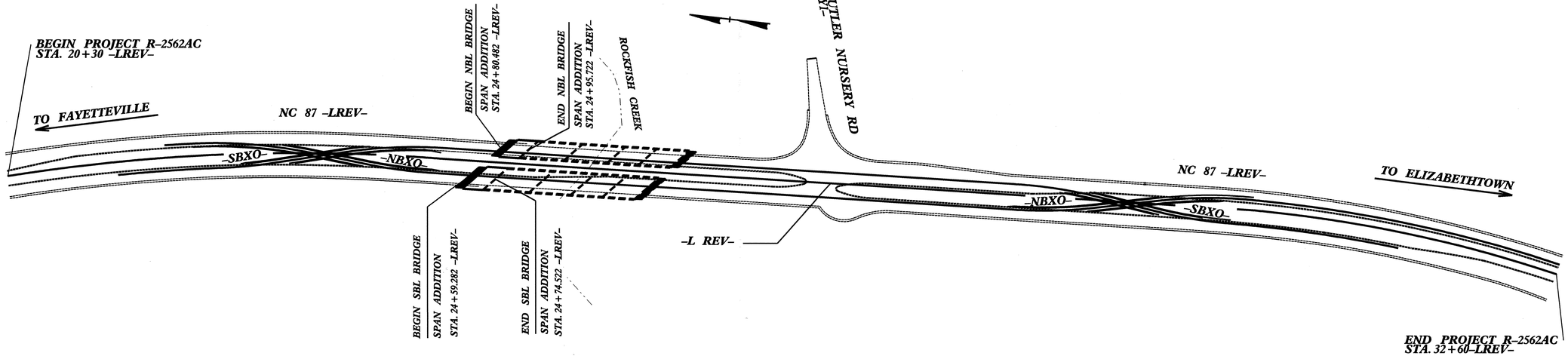
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
CUMBERLAND COUNTY

LOCATION: ***NC 87 FROM SOUTH OF I-95 TO SOUTH OF SR 2233***
NC 87 DUAL BRIDGES OVER ROCKFISH CREEK

TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURES



VICINITY MAP



DESIGN DATA

ADT (1996) = 9,400
ADT (2020) = 18,600
DHV = 11%
D = 65%
T = 15%
V = 100 km/h

LENGTH OF ROADWAY PROJECT R-2562AC = 1.069KM
LENGTH OF STRUCTURES PROJECT R-2562AC = 0.015KM
TOTAL LENGTH, STATE PROJECT R-2562AC = 1.084KM

Prepared In the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., NC, 27610

2002 STANDARD SPECIFICATIONS

JOHN C. FRYE, P. E.
PROJECT ENGINEER

W. A. DAVIS, P. E.
PROJECT DESIGN ENGINEER

LETTING DATE:
January 16, 2007

STRUCTURE DESIGN UNIT
1000 Birch Ridge Dr., NC, 27610

NORTH CAROLINA PROFESSIONAL SEAL 14552 ENGINEER GREGORY R. PERFETTI

11-30-06

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER

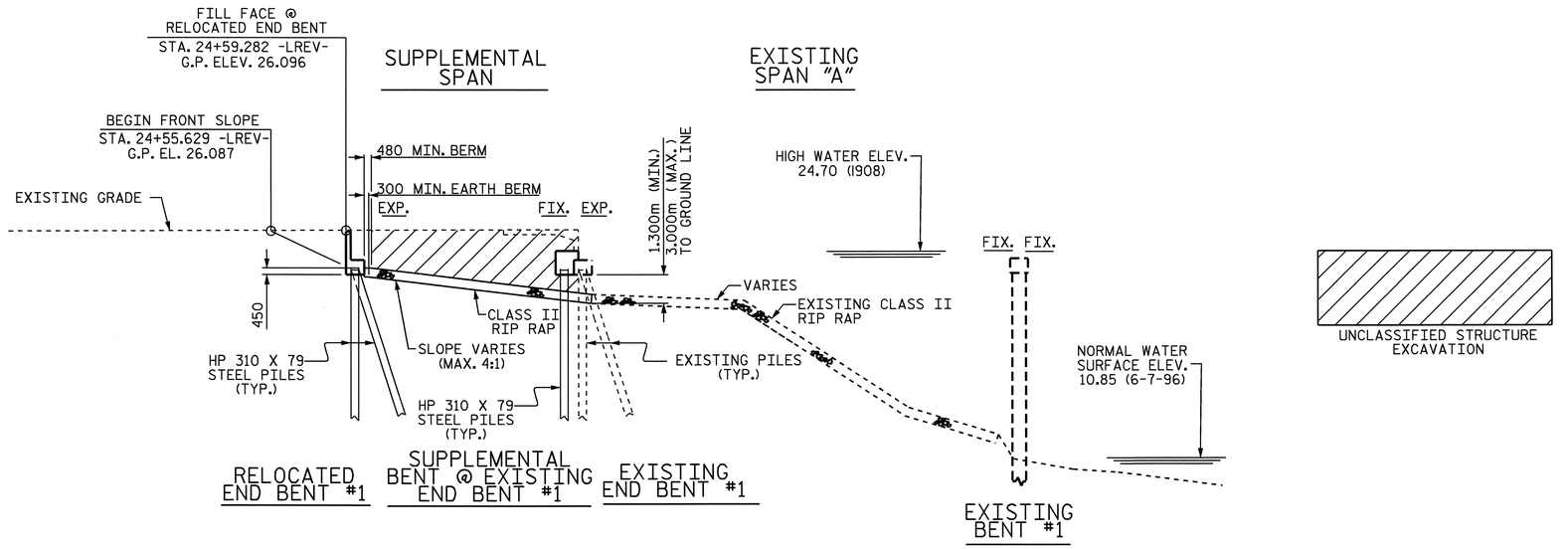
DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR *DATE*

PVI = 24+20.000 -LREV-
EL. = 25.977
VC = 90m

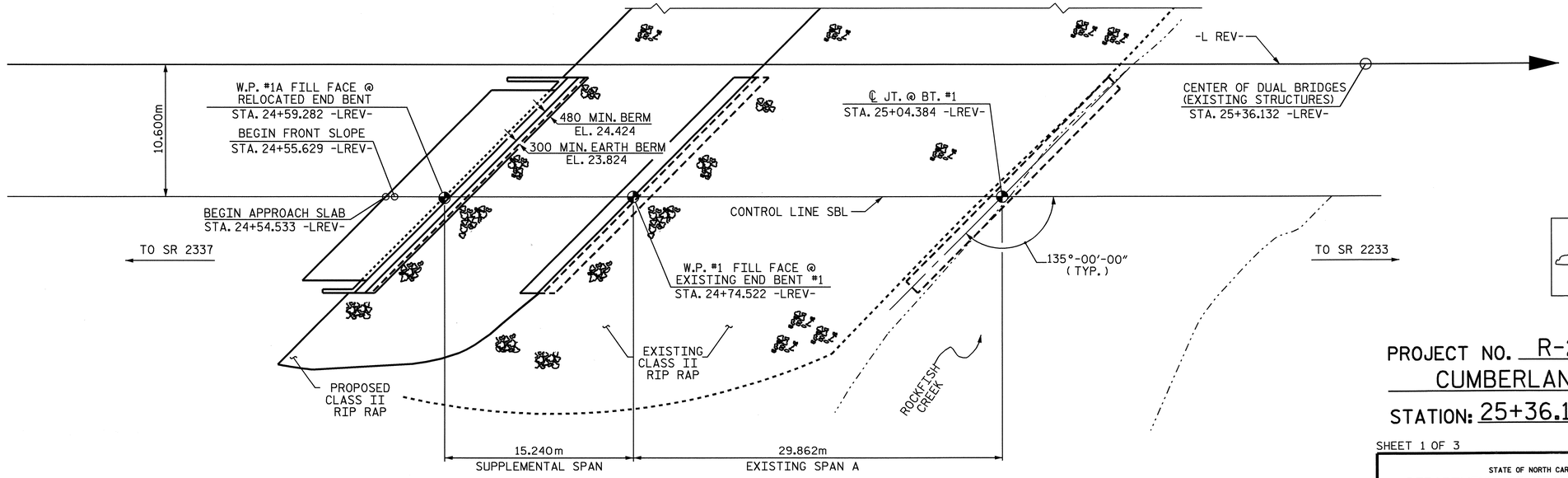
-0.4212% △ +0.3000%

GRADE DATA (SBL)



SECTION ALONG CONTROL LINE SBL

(SECTIONS @ BENTS AND END BENTS ARE TAKEN @ RIGHT ANGLES)



PLAN

(PILES ARE NOT SHOWN IN PLAN VIEW FOR CLARITY
EXISTING WINGS ARE NOT SHOWN IN PLAN VIEW FOR CLARITY)

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS
11/2/06

METRIC

PROJECT NO. R-2562AC
CUMBERLAND COUNTY
STATION: 25+36.132-LREV-

SHEET 1 OF 3 BRIDGE NO. 325

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

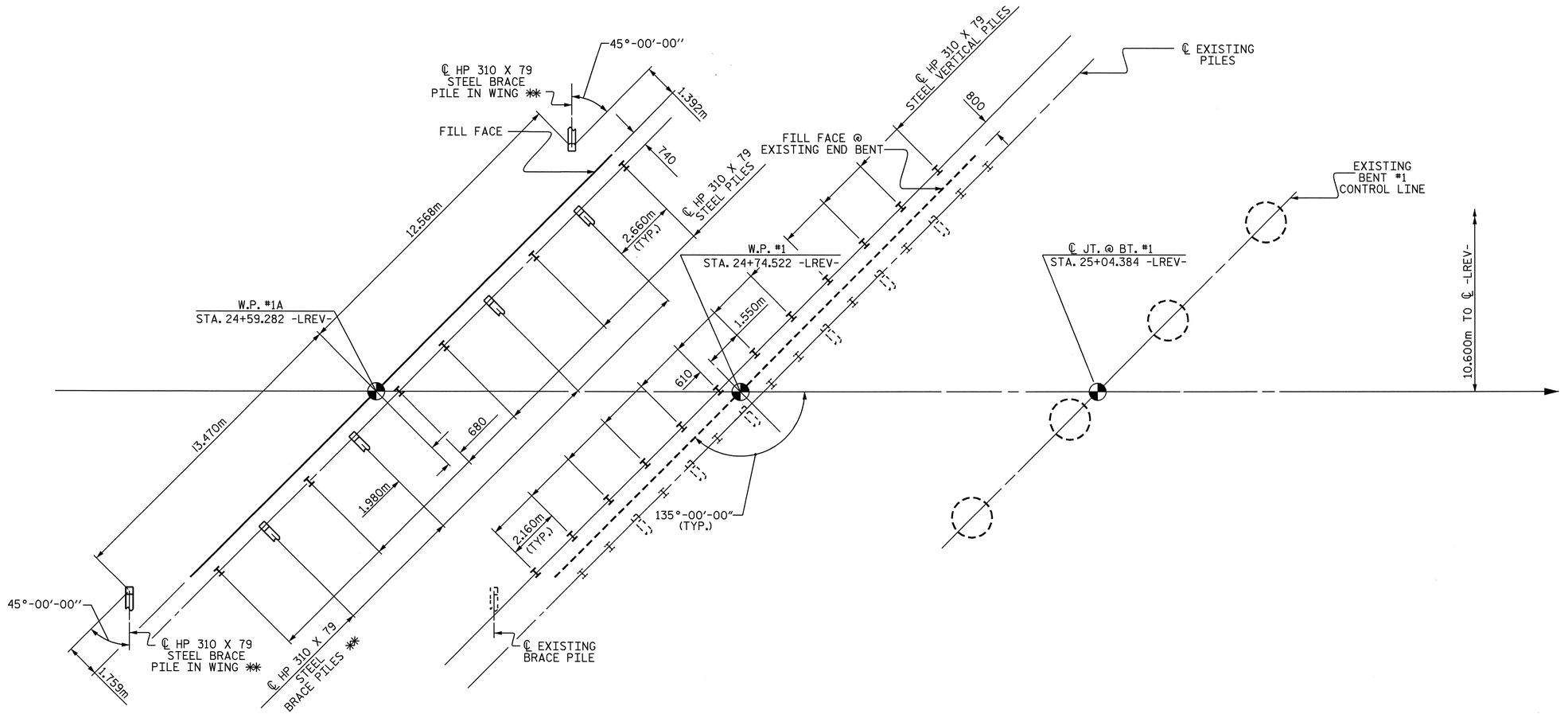
BRIDGE ON NC 87 OVER ROCKFISH CREEK BETWEEN SR 2337 AND SR 2233 (SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			44

DRAWN BY : T.L. CLELLAND DATE : 4/10/06
CHECKED BY : W.A. DAVIS DATE : 5/1/06

02-NOV-2006 14:21
S:\PG4\squadh\R-2562AC\tclelland\R-2562AC_sd_GD.dgn

S:\PG4\squadh\R-2562AC\tclelland\R-2562AC_sd_GD.dgn
tclelland



RELOCATED END BENT #1

SUPPLEMENTAL BENT @ EXISTING END BENT #1

EXISTING END BENT #1

** PILE BATTER 250/1000

BENT #1

FOUNDATION LAYOUT

PROJECT NO. R-2562AC

CUMBERLAND COUNTY

STATION: 25+36.132-LREV-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

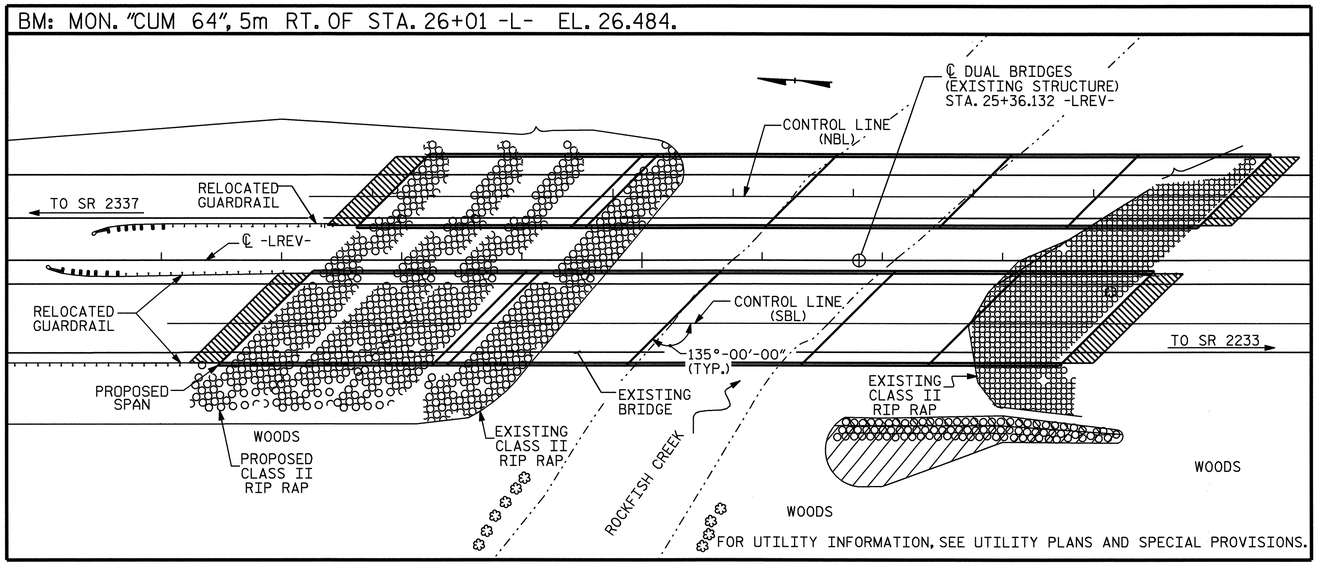
GENERAL DRAWING

BRIDGE ON NC 87 OVER ROCKFISH CREEK BETWEEN SR 2337 AND SR 2233 (SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS
11/3/06

DRAWN BY : T.L. CLELLAND DATE : 4/11/06
CHECKED BY : W.A. DAVIS DATE : 7/11/06



LOCATION SKETCH

HYDROGRAPHIC DATA

DESIGN DISCHARGE_____= 299 m^3/s
FREQUENCY OF DESIGN FLOOD_____ = 50 yr.
DESIGN HIGH WATER ELEVATION_____ = 16.71 m
DRAINAGE AREA_____ = 106.7 sq. km.
BASIC DISCHARGE (Q100)_____ = 369 m^3/s
BASIC HIGH WATER ELEVATION_____= 17.48 m

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE_____= 576+ m^3/s
FREQUENCY OF OVERTOPPING FLOOD_____ = 500+ yr.
OVERTOPPING FLOOD ELEVATION_____= 26.0 m

NOTES:

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

ALL ELEVATIONS ARE IN METERS.

ASSUMED LIVE LOAD = MS 18 OR ALTERNATE LOADING.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET S-NM.

FOR FABRICATED METAL STAY-IN-PLACE FORMS, SEE SPECIAL PROVISIONS.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE "STANDARD SPECIFICATIONS FOR SEISMIC DESIGN OF HIGHWAY BRIDGES" FOR SEISMIC PERFORMANCE CATEGORY A.

REMOVAL OF THE EXISTING STRUCTURE CONSISTS OF: REMOVE THE EXISTING APPROACH SLAB AT END BENT #1. REMOVE THE BACKWALL AND WINGS OF EXISTING END BENT #1 AS SHOWN ON EXISTING END BENT #1 (SBL) SHEET.

THIS BRIDGE HAS BEEN DESIGNED BY THE STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO STANDARD SPECIFICATIONS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 10.000m EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE MEASURED AND PAID FOR AS UNCLASSIFIED STRUCTURE EXCAVATION.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

DRIVE PILES AT RELOCATED END BENT 1 TO A MINIMUM BEARING CAPACITY OF 530 kN EACH.

DRIVE PILES AT SUPPLEMENTAL BENT AT EXISTING END BENT 1 TO AN ELEVATION NO HIGHER THAN 17.3m, AND A MINIMUM BEARING CAPACITY OF 530 kN EACH PLUS CAPACITY TO ACCOUNT FOR DOWN DRAG OR NEGATIVE SKIN FRICTION AND SCOUR.

WHEN DRIVING PILES, DO NOT EXCEED THE MAXIMUM BLOW COUNT.

PROVIDE GALVANIZED STEEL PILES AT SUPPLEMENTAL BENT AT EXISTING END BENT 1, NBL AND SBL, IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS AND THE GALVANIZING STEEL PILES SPECIAL PROVISION.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

CLEAN EXISTING END BENT #1 FILL FACE TO REMOVE ALL DIRT, DEBRIS, GRIME, ETC. BEFORE FORMING AND CASTING SUPPLEMENTAL BENT CAP.

FOR CLEANING AND PAINTING EXISTING STEEL PILES, SEE SPECIAL PROVISIONS.

FOR EXISTING EVAZOTE JOINT SEALS AT END BENT #1, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVSIONS.

FOR METRIC STRUCTURAL STEEL, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR STEEL H PILES, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	914mm PRESTRESSED CONCRETE GIRDERS		HP 310 X 79 STEEL PILES		GALVANIZING STEEL PILES	CONCRETE BARRIER RAIL	PLAIN CLASS II RIP RAP (600mm THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS	CLEANING & PAINTING EXISTING STEEL PILES
	LUMP SUM	CU. METERS	SQ. METERS	SQ. METERS	CU. METERS	LUMP SUM	kg	NO.	METERS	NO.	METERS	LUMP SUM	METERS	SQ. METERS	SQ. METERS	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	LUMP SUM		242.9	275.6		LUMP SUM		7	100.814				30.5			LUMP SUM	LUMP SUM	
RELOCATED END BENT					39.0		3820			12	120			67	68			
SUPPLEMENTAL BENT					48.0		2845			12	120	LUMP SUM						
TOTAL	LUMP SUM	1285	242.9	275.6	87.0	LUMP SUM	6665	7	100.814	24	240	LUMP SUM	30.5	67	68	LUMP SUM	LUMP SUM	LUMP SUM

DRAWN BY : T.L. CLELLAND DATE : 4/11/06
CHECKED BY : W.A. DAVIS DATE : 7/11/06

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS II
11/29/06

PROJECT NO. R-2562AC
CUMBERLAND COUNTY
STATION: 25+36.132-LREV-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE ON NC 87 OVER ROCKFISH CREEK BETWEEN SR 2337 AND SR 2233 (SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			44

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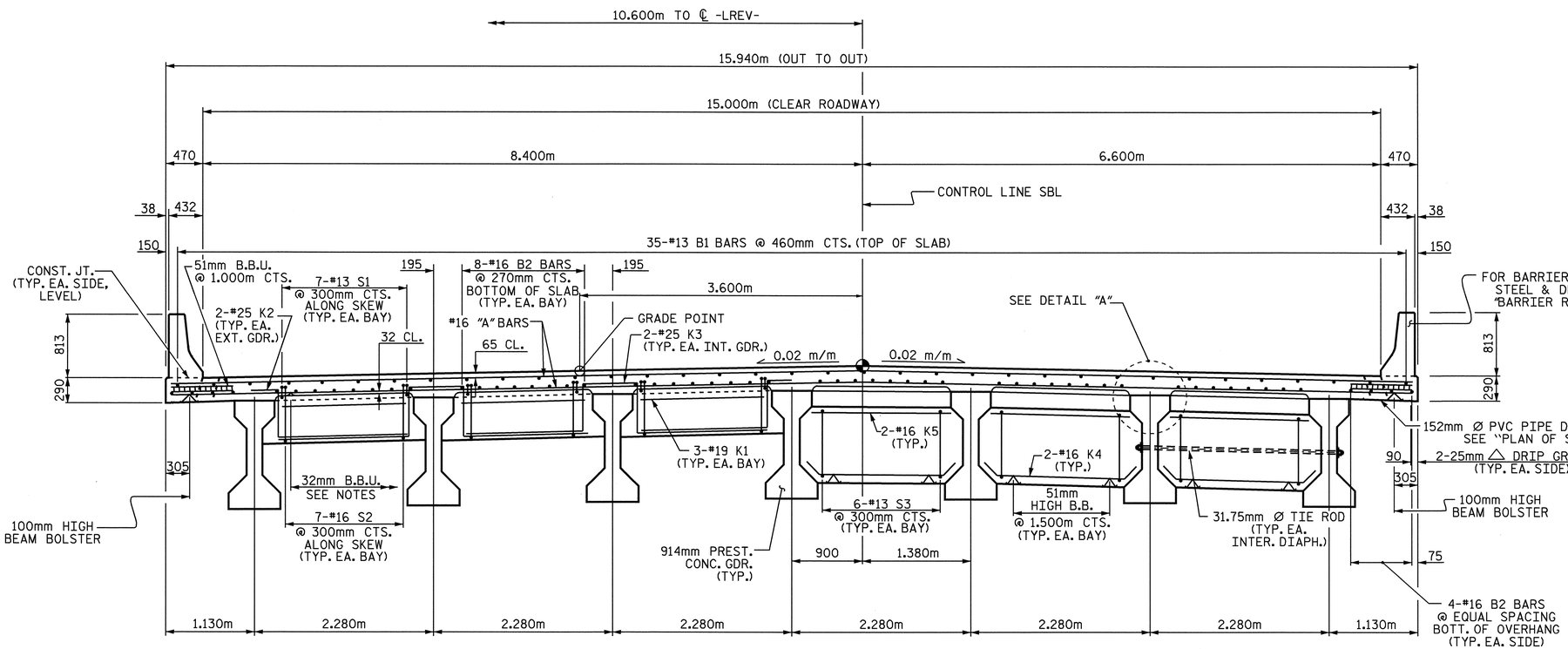
tclelland



PART TYPICAL SECTION
SHOWING END BENT & BENT DIAPHRAGMS

PART TYPICAL SECTION
SHOWING INTERMEDIATE DIAPHRAGMS

NOTES

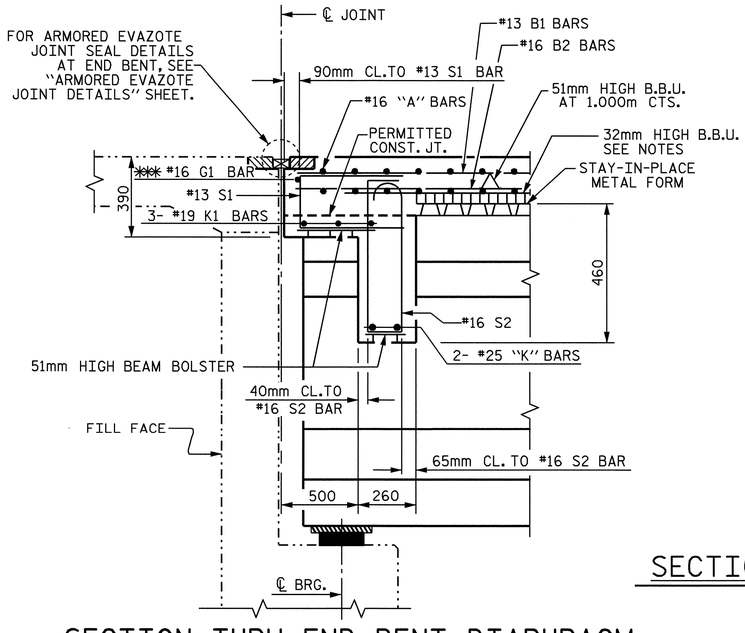
PROVIDE 32mm HIGH BEAM BOLSTERS UPPER AT 1.200m CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 1.200m CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 65mm ABOVE THE TOP OF THE REMOVABLE FORM.

LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY AS NECESSARY TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 20.7 MPa.

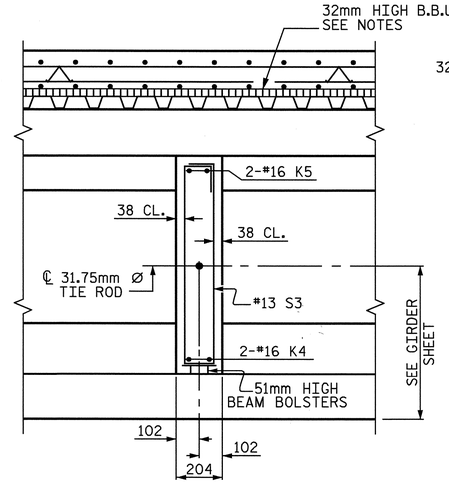
TEMPORARY STRUTS SHALL BE PLACED BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE DIAPHRAGMS, AND THE NUTS ON THE 31.75 MM DIA. TIE RODS SHALL BE FULLY TIGHTENED BEFORE THE DIAPHRAGMS ARE CAST. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED. THE TIE RODS SHALL BE RE-TIGHTENED AFTER THE STRUTS HAVE BEEN REMOVED.

CONCRETE IN INTERMEDIATE DIAPHRAGMS MAY BE CLASS A IN LIEU OF CLASS AA. PAYMENT SHALL BE MADE UNDER THE UNIT CONTRACT PRICE FOR REINFORCED CONCRETE DECK SLAB.

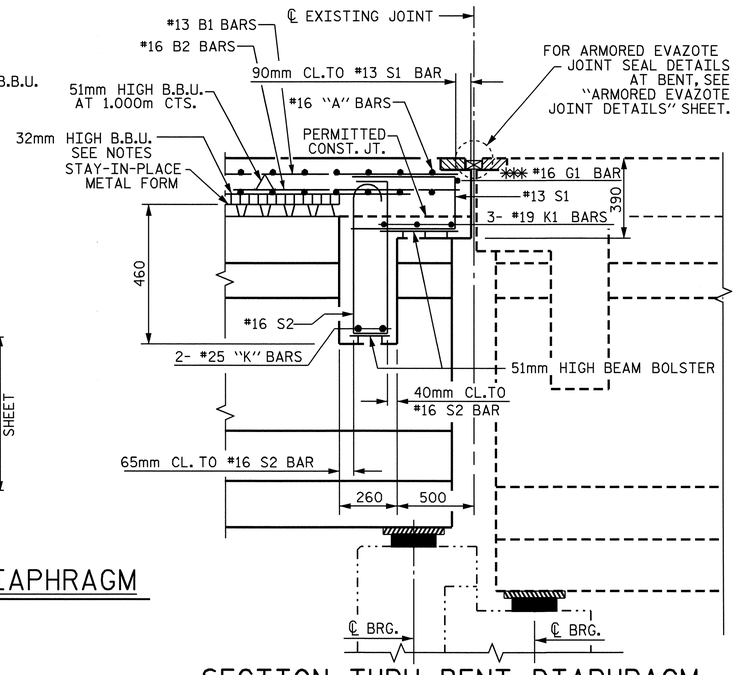


SECTION THRU END BENT DIAPHRAGM

*** #16 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.



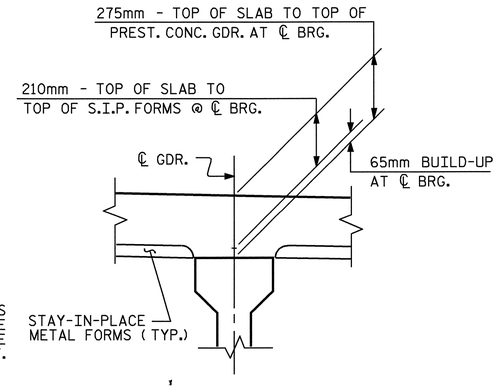
SECTION THRU INTERMEDIATE DIAPHRAGM



SECTION THRU BENT DIAPHRAGM

*** #16 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.

EXISTING SPAN A



DETAIL "A"

PROJECT NO. R-2562AC
CUMBERLAND COUNTY
STATION: 25+36.132-LREV-

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KIRSTY W. ALFORD 10/24/06

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS 10/24/06

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE TYPICAL SECTION (SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			44

DRAWN BY : T.L. CLELLAND DATE : 4/25/06
CHECKED BY : K.W. ALFORD DATE : 5/22/06

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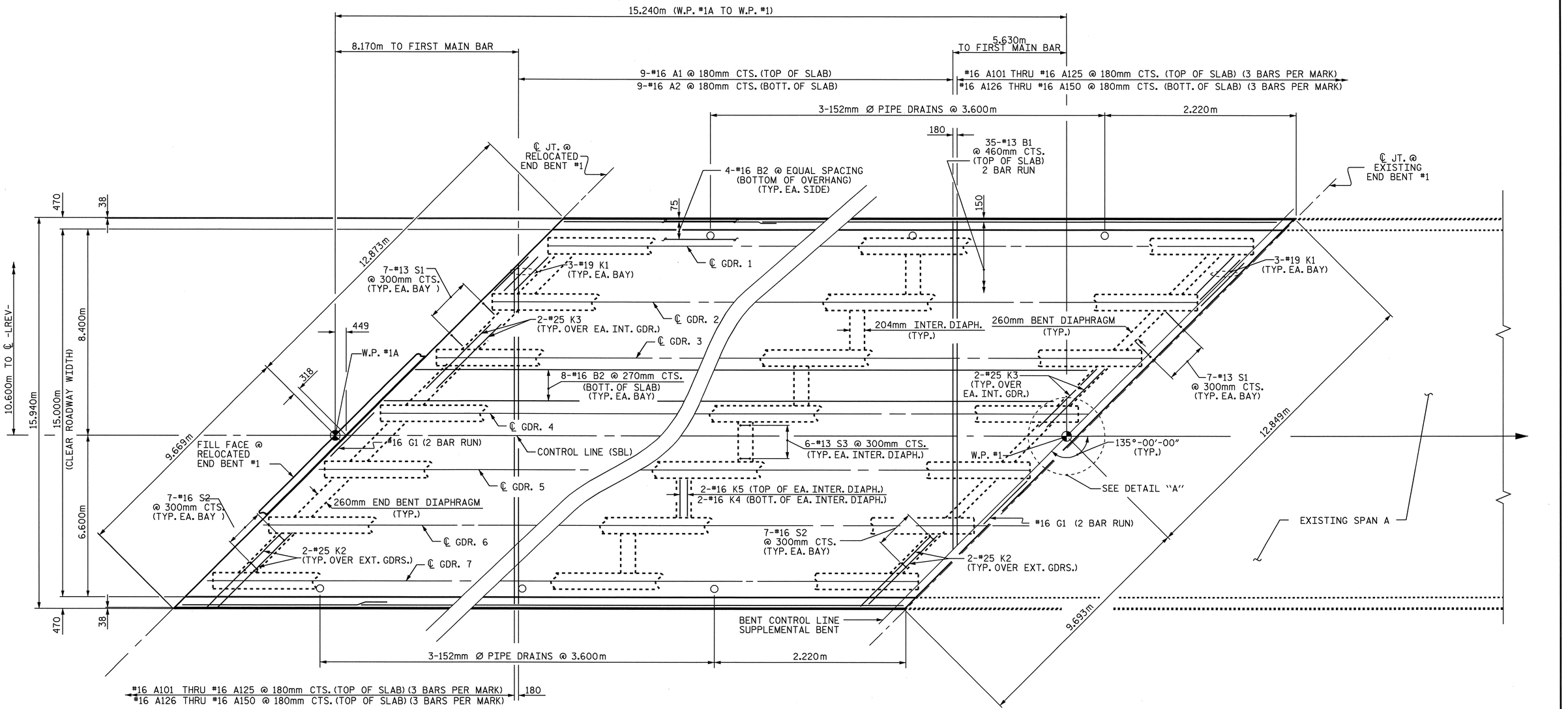
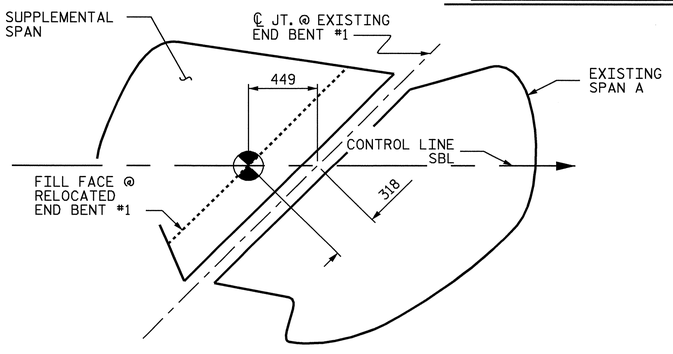
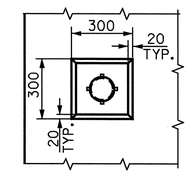
tclelland



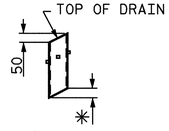
PLAN OF SUPPLEMENTAL SPAN



DETAIL "A"



PLAN OF RECESS

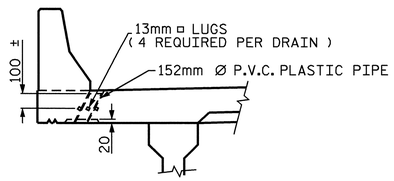


* TO BE SET TO MATCH SLOPE OF BOTTOM OF OVERHANG (6 DRAINS REQUIRED)

PIPE DETAIL

TOP OF FLOOR DRAINS TO SET 10mm BELOW SURFACE OF SLAB.

4 - 13mm □ LUGS TO BE GLUED TO THE P.V.C. PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN.



ELEVATION

DRAIN DETAILS

DRAWN BY : T.L.CLELLAND DATE : 4/18/06
CHECKED BY : K.W. ALFORD DATE : 5/22/06

PROJECT NO. R-2562AC
CUMBERLAND COUNTY
STATION: 25+36.132-LREV-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE PLAN OF SPANS (SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD 11/3/06

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS 11/3/06

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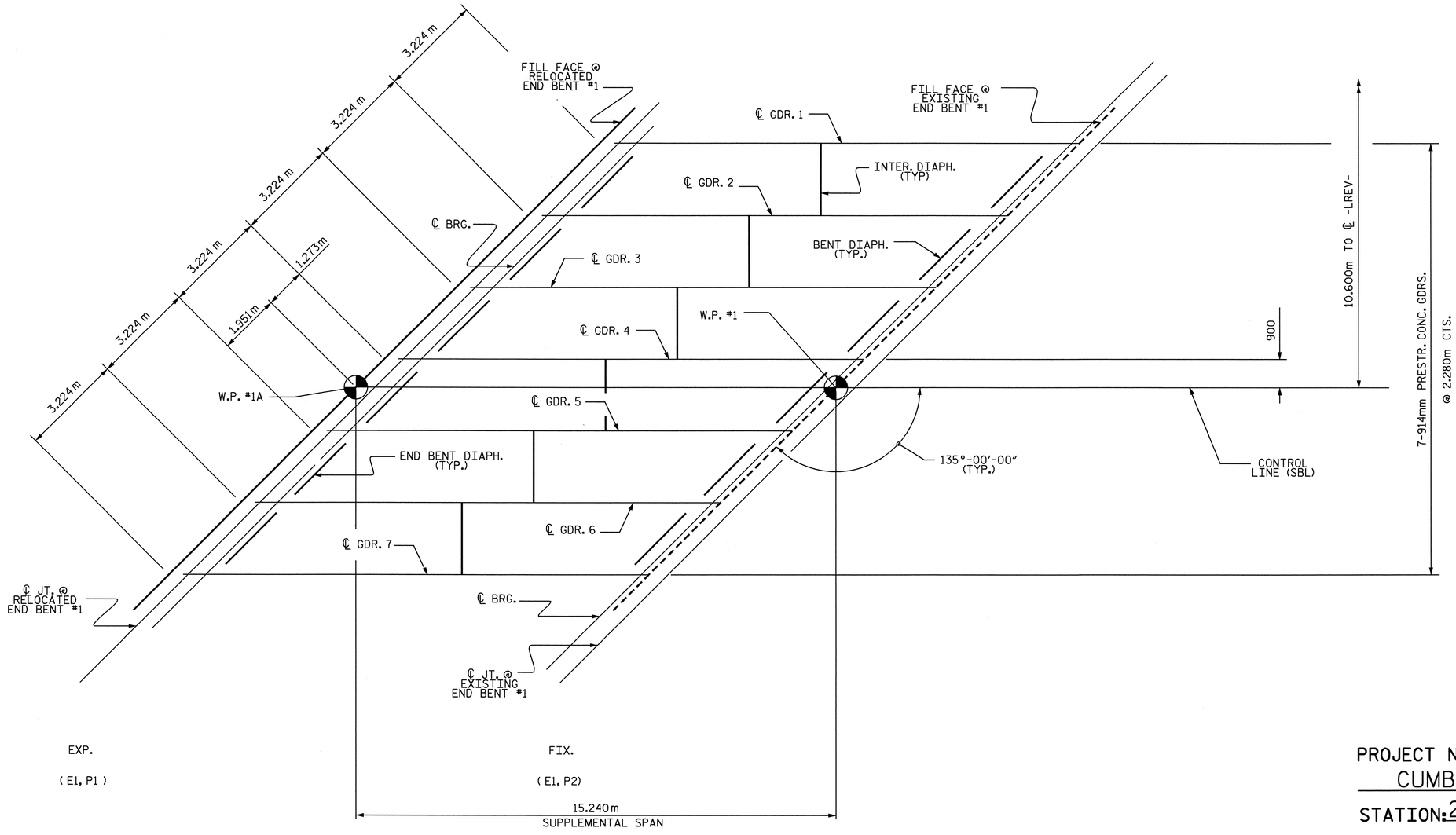
tclelland



GIRDER LAYOUT

PROJECT NO. R-2562AC
CUMBERLAND COUNTY
STATION: 25+36.132-LREV-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
GIRDER LAYOUT
(SBL)

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD 10/24/06

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS 10/24/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			44

DRAWN BY : T.L. CLELLAND DATE : 4/21/06
CHECKED BY : K.W. ALFORD DATE : 5/23/06

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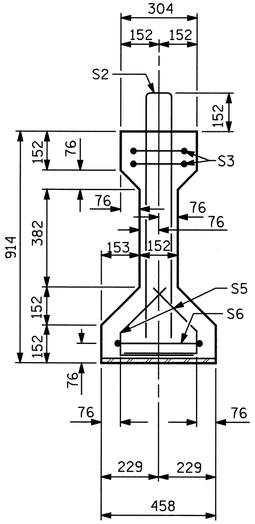
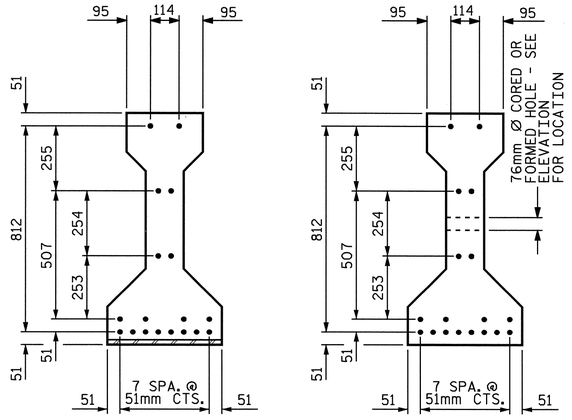


SECTION A-A



12.70mm Ø LOW RELAXATION STRAND LAYOUT

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 1860 STRANDS AND SHALL CONFORM TO AASHTO M203M EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

TIE ROD ASSEMBLY SHALL BE AASHTO M270 GRADE 250 STRUCTURAL STEEL.

ALL REINFORCING STEEL SHALL BE GRADE 420.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES.

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE SPECIFICATIONS.

BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.

ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

ALL PRESTRESSED STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

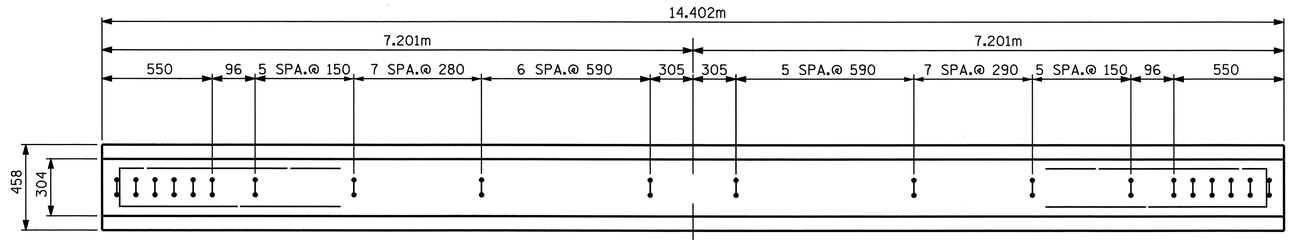
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 27.6 MPa.

DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

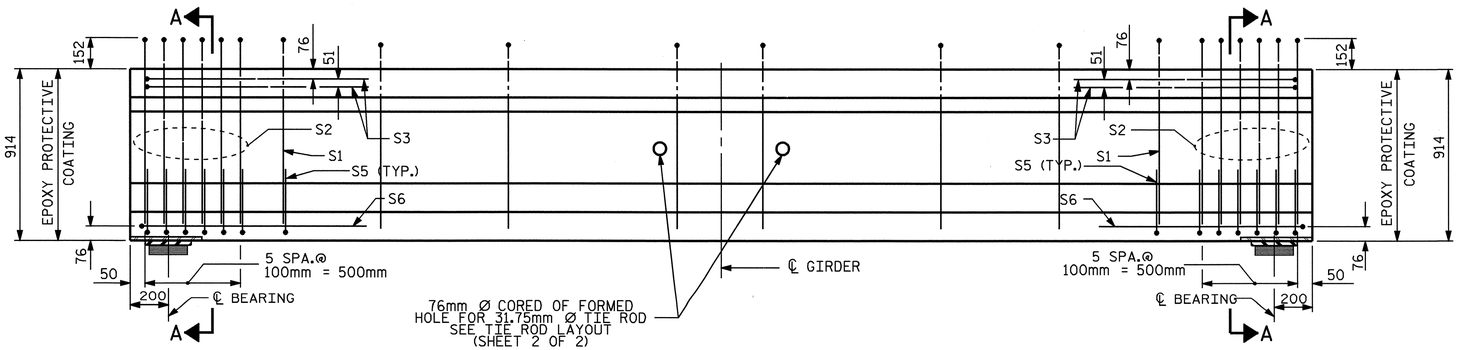
THE TOP SURFACE OF THE GIRDER SHALL BE RAKED TO A DEPTH OF 6mm EXCEPT IN THE AREA BETWEEN THE STIRRUP AND THE EDGE OF THE GIRDER.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

FOR VERTICAL CRACKS IN PRESTRESSED CONCRETE GIRDERS PRIOR TO DETENSIONING, SEE SPECIAL PROVISIONS.



PLAN OF GIRDER



ELEVATION OF GIRDER

12.7 Ø L.R GRADE 1860 STRANDS

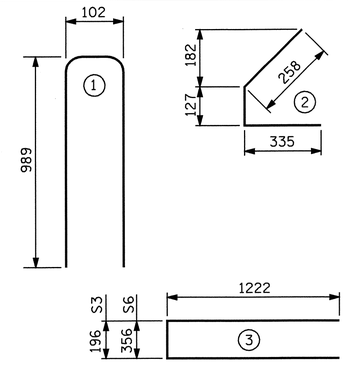
AREA (mm^2)	ULTIMATE STRENGTH (kN PER STRAND)	APPLIED PRESTRESS (kN PER STRAND)
98.71	183.7	137.8

REINFORCING STEEL FOR ONE GDR.

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	38	#13	1	2080	79
S2	12	#16	1	2080	39
S3	4	#13	3	2640	10
S5	48	#13	2	720	34
S6	2	#13	3	2800	6

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL (kg)	37.9 MPa CONCRETE (m^3)	12.70mm Ø L.R. STRANDS (No.)
	168	3.428	18

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
7	14.402	100.814

PROJECT NO. R-2562AC

CUMBERLAND COUNTY

STATION: 25+36.132-LREV

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SBL

AASHTO TYPE II
PRESTRESSED CONCRETE GIRDER
(SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			44

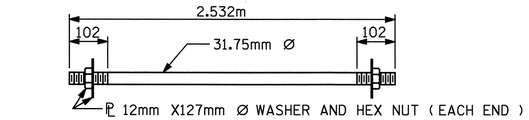
ASSEMBLED BY : T.L. CLELLAND DATE : 4/27/06
CHECKED BY : K.W. ALFORD DATE : 5/23/06

DRAWN BY : EEM 2/97
CHECKED BY : VP 2/97
REV. 8/16/99 RWW/LES

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD 10/24/06

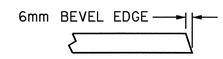
NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM R. WILSON 10/24/06

NCBDSM

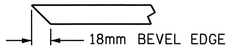


31.75mm Ø TIE ROD ASSEMBLY

(6 COMPLETE ASSEMBLIES REQUIRED)

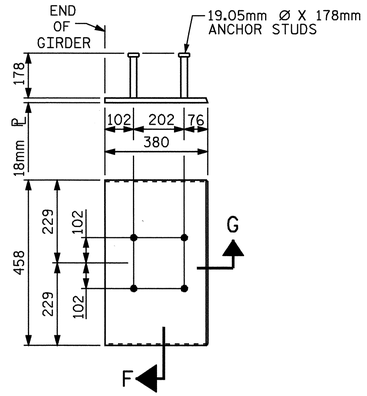


SECTION "G"



SECTION "F"

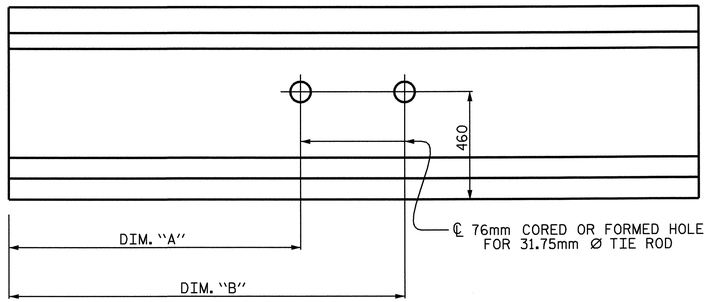
(SEE NOTES)



EMBEDDED PLATE "B-1" DETAILS

(2 REQ'D PER GIRDER)

SUPPLEMENTAL SPAN		
GIRDER	DIM. "A"	DIM. "B"
1	6.061m	
2	6.061m	8.341m
3	6.061m	8.341m
4	6.061m	8.341m
5	6.061m	8.341m
6	6.061m	8.341m
7		8.341m



GIRDER LAYOUT

NOTE: ONLY ONE HOLE IS REQUIRED ON EXTERIOR GIRDER.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

12.70mm Ø LOW RELAXATION	SUPPLEMENTAL SPAN GIRDERS 1 THRU 7										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.008	0.015	0.021	0.024	0.026	0.024	0.021	0.015	0.008	0.000
✳ DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD ↓	0.000	0.004	0.007	0.010	0.012	0.013	0.012	0.010	0.007	0.004	0.000
FINAL CAMBER ↑	0	4	8	11	12	13	12	11	8	4	0

ALL VALUES ARE SHOWN IN METERS, EXCEPT " FINAL CAMBER ", WHICH IS GIVEN IN MILLIMETERS.
✳ INCLUDES FUTURE WEARING SURFACE

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS
10/24/06

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD
10/24/06

PROJECT NO. R-2562AC
CUMBERLAND COUNTY
STATION: 25+36.132-LREV-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
PRESTRESSED CONCRETE GIRDER
DETAILS
(SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			44

ASSEMBLED BY : T.L.CLELLAND	DATE : 4/21/06
CHECKED BY : K.W. ALFORD	DATE : 5/23/06
DRAWN BY : ELR 11/91	REV. 8/16/99 MAB/LES
CHECKED BY : GRP 11/91	REV. 10/17/00 RWW/LES
	REV. 7/10/01RR LES/RDR

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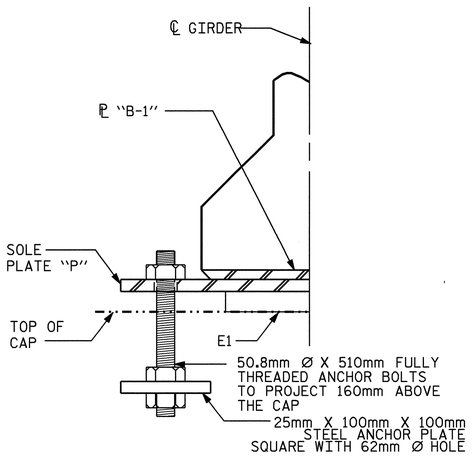
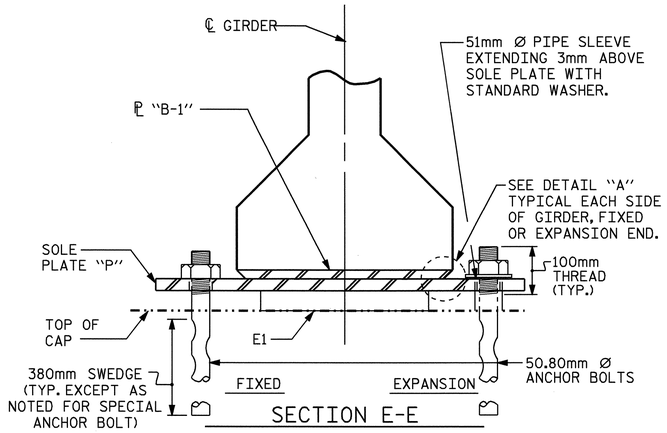
STD. NO. PCG11SM

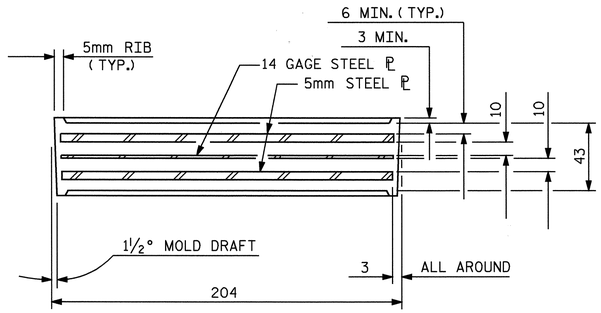


SPECIAL ANCHOR BOLT DETAIL

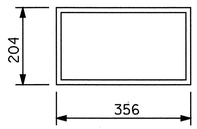
(HALF SECTION)



SECTION E-E



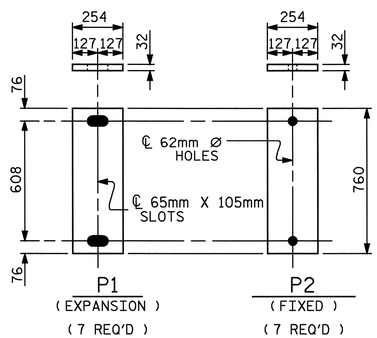
TYPICAL SECTION OF ELASTOMERIC BEARINGS



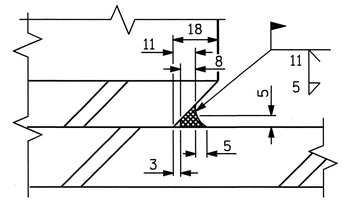
E1 (14 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE II

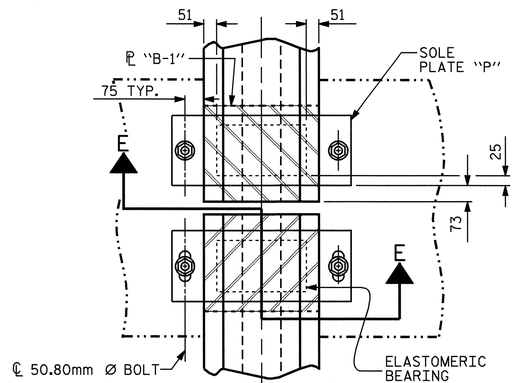


SOLE PLATE DETAILS ("P")



DETAIL "A"

— LOAD RATINGS —	
	MAX.D.L.+L.L.
914mm PCG -TYPE II	366 kN



TYPICAL HALF-PLAN

(SHOWING SIMPLE SPAN BENT)

NOTES

FOR ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF ½ TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

THE 51mm Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.

STEEL SOLE PLATES, ANCHOR BOLTS, NUTS, STEEL ANCHOR PLATE, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 149°C. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

SOLE PLATE "P", BOLTS, NUTS, WASHERS, STEEL ANCHOR PLATE, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291M-12 OR AASHTO M292M-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293M. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

PROJECT NO. R-2562AC

CUMBERLAND COUNTY

STATION: 25+36.132-LREV-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE (SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			44

ASSEMBLED BY : T.L.CLELLAND	DATE : 4/28/06
CHECKED BY : K.W. ALFORD	DATE : 5/24/06
DRAWN BY : WJH 8/89	REV. 8/16/99 RWW/LES
CHECKED BY : CRK 8/89	REV. 10/17/00 RWW/LES
	REV. 7/10/01 RWW/LES

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD 11/29/06

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM J. DAVIS 11/29/06

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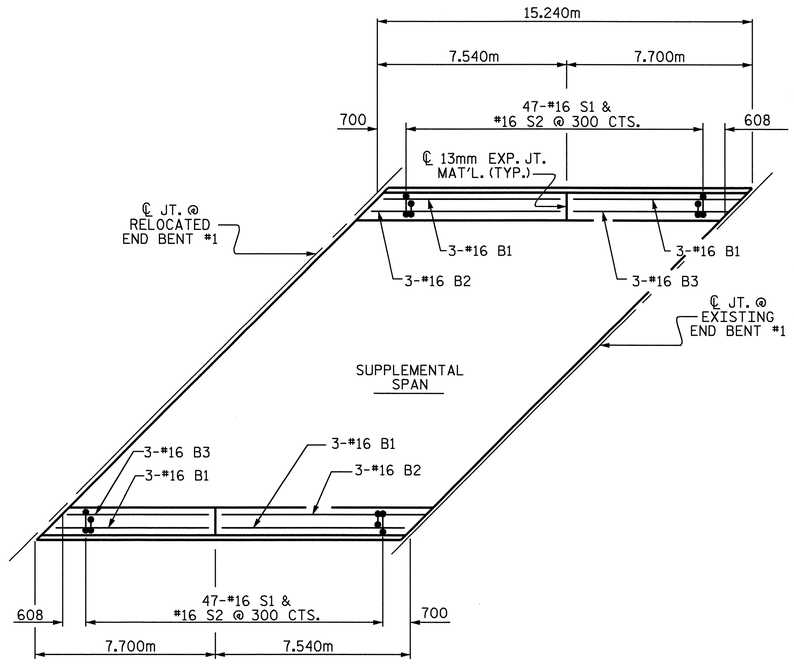
STD. NO. EB3SM



PLAN

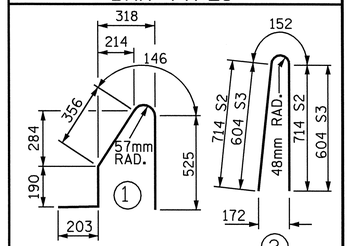
NOTES

THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 20.7 MPa.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE BARRIER RAIL ON EXISTING SPAN "A" AT THE EXISTING GUARDRAIL ATTACHMENT SHALL BE BUILT UP TO MATCH THE BARRIER RAIL ON THE SUPPLEMENTAL SPAN AS DIRECTED BY ENGINEER. THIS SHALL BE INCIDENTAL TO THE COST OF THE BARRIER RAIL.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

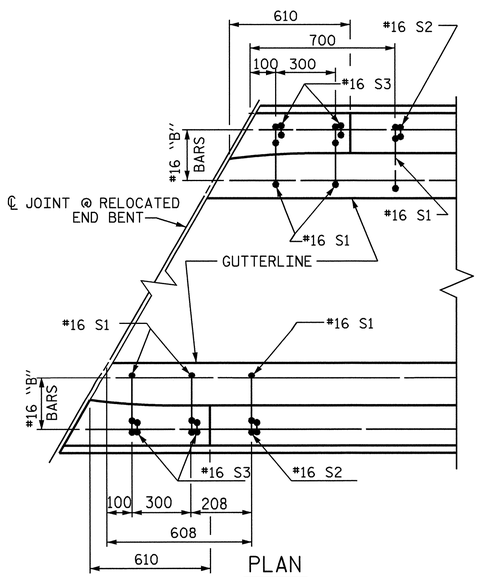
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ S1	102	#16	1	1420	225
✱ S2	94	#16	2	1580	231
✱ S3	8	#16	2	1360	17
✱ B1	12	#16	STR	7420	138
✱ B2	6	#16	STR	7680	72
✱ B3	6	#16	STR	7160	67

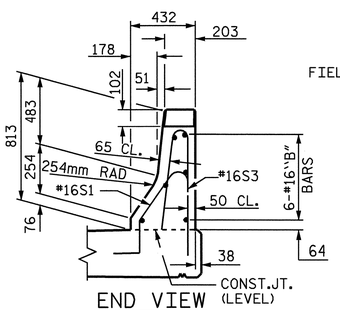
✱ EPOXY COATED REINFORCING STEEL 750kg

CLASS AA CONCRETE 7.0 CU. METER

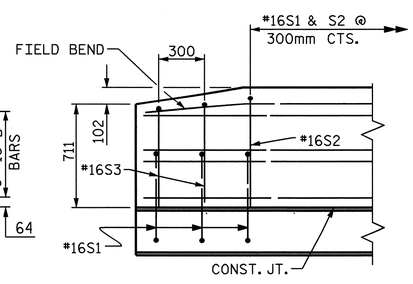
CONCRETE BARRIER RAIL 30.5 METERS



PLAN

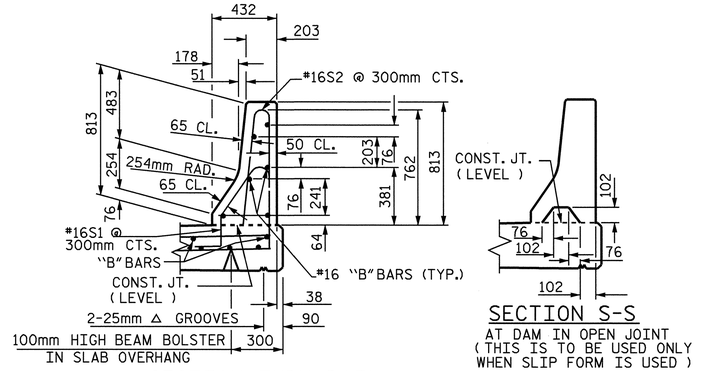


END VIEW



SIDE VIEW

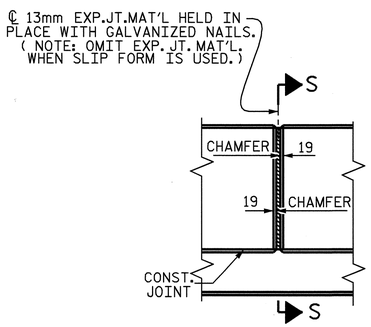
BARRIER RAIL - END OF RAIL DETAILS



SECTION THRU RAIL

SECTION S-S

AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY
WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

PROJECT NO. R-2562AC

CUMBERLAND COUNTY

STATION: 25+36.132-LREV-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD CONCRETE BARRIER RAIL (SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD 11/29/06

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS 11/29/06

ASSEMBLED BY : T.L. CLELLAND	DATE : 4/20/06		
CHECKED BY : K.W. ALFORD	DATE : 5/31/06		
DRAWN BY : ARB 5/87	REV. 5/16/97 EEM/RGW		
CHECKED BY : SJD 9/87			

CBRISM

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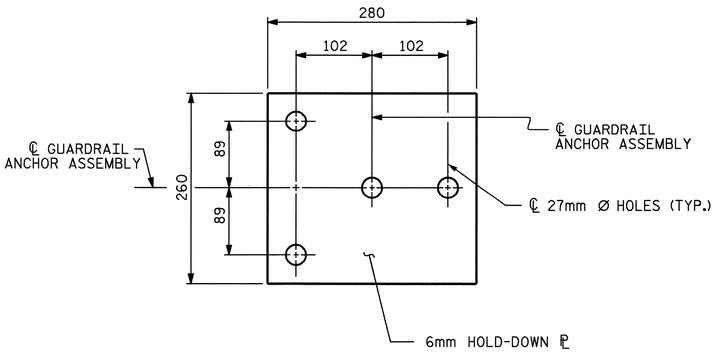
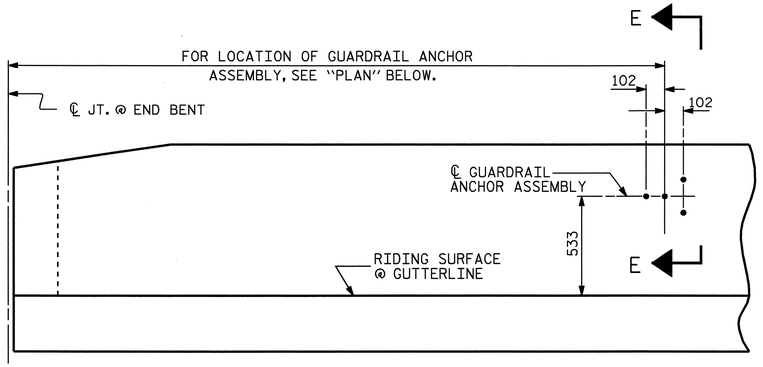
tclelland



PLAN



ELEVATION

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 6mm HOLD DOWN PLATE AND 4 - 22.23mm Ø BOLTS WITH NUTS AND WASHERS.

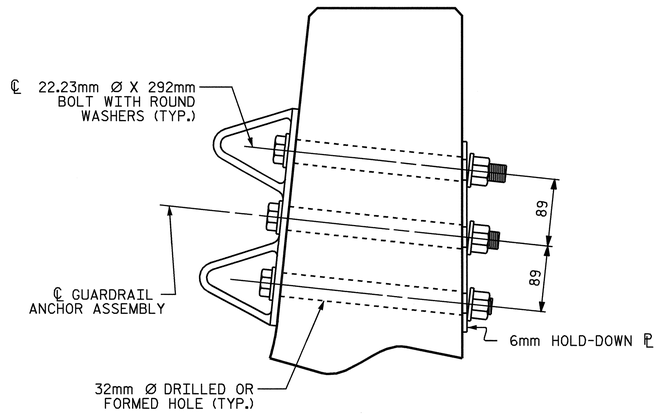
THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 250. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A563. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 22.23mm Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

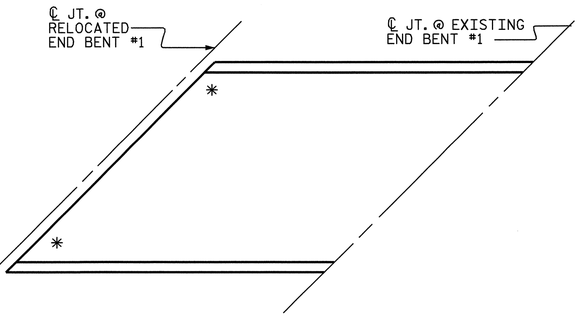
AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.



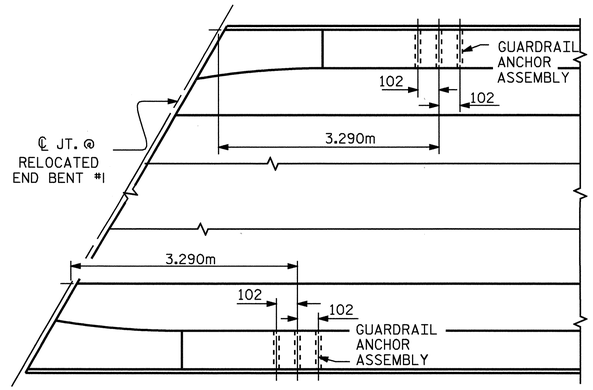
SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

PROJECT NO. R-2562AC
CUMBERLAND COUNTY
STATION: 25+36.132-LREV-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE FOR BARRIER RAIL (SBL)

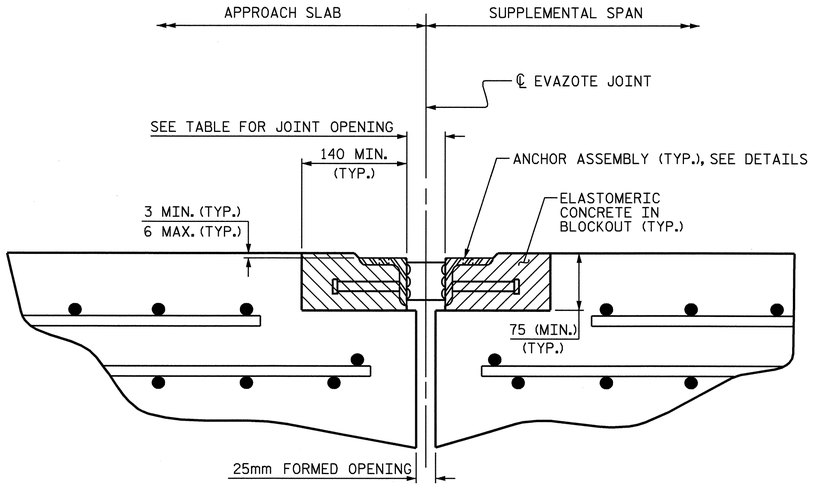
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD 10/24/06

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS 10/24/06

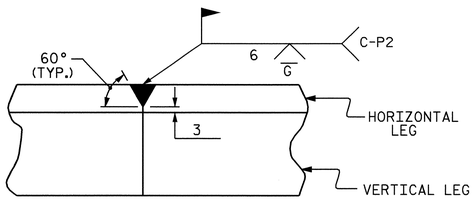
ASSEMBLED BY : T.L. CLELLAND	DATE : 4/20/06
CHECKED BY : K.W. ALFORD	DATE : 5/24/06
DRAWN BY : JMB 12/87	REV. 5/16/97R EEM/RGW
CHECKED BY : ARB 12/87	

STD. NO. GRA1SM



ARMORED JOINT DETAILS

SECTION NORMAL TO JOINT AT RELOCATED END BENT



DETAIL- FIELD WELD SPLICE OF ANGLE

NOTES

ANGLES SHALL CONFORM TO AASHTO M270 GRADE 250 STEEL OR APPROVED EQUAL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169 GRADES 1010 THRU 1020 OR APPROVED EQUAL.

STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON THE PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.

UPON COMPLETION OF SHOP FABRICATION, THE ENTIRE ANCHOR ASSEMBLY SHALL BE METALLIZED. THE 12.70mm Ø STUD ANCHORS AND ANCHOR TABS NEED NOT BE METALLIZED. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

ANCHOR ASSEMBLY SHALL BE MADE CONTINUOUS THE LENGTH OF THE JOINT FROM GUTTER TO GUTTER. FOR FIELD SPLICES AT ALL CROWN BREAK POINTS, THE ENDS OF THE STEEL ANGLES SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE. FINISHED FIELD WELDS SHALL BE GROUND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 0.100mm OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ANCHOR ASSEMBLY SEGMENTS SHALL NOT BE LESS 3.6m NOR MORE THAN 6.1m IN LENGTH. SHORTER SEGMENTS MAY BE USED AT THE EDGE OF ROADWAY OR AT POINTS OF STAGED CONSTRUCTION.

THE ANCHOR ASSEMBLY SHALL BE SECURED AND LEVELED AS SHOWN IN THE "ARMORED JOINT ANCHOR ASSEMBLY DETAILS". NO SUBMITTALS ARE REQUIRED FOR 9.53mm Ø EXPANSION ANCHORS, NUTS OR WASHERS. THE CONTRACTOR MAY SUBMIT FOR APPROVAL AN ALTERNATE METHOD OF ALIGNING AND LEVELING THE ANGLES. THE ALTERNATE METHOD SHALL NOT INCLUDE ANY WELDING TO THE OUTSIDE FACE OF THE ANGLES.

AFTER THE ELASTOMERIC CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE ANY EXCESS CONCRETE THAT COMES THROUGH THE WEEP HOLES AND THOROUGHLY CLEAN THE ANGLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM OF 0.100mm OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

SEE SPECIAL PROVISIONS FOR EVAZOTE JOINT SEALS.

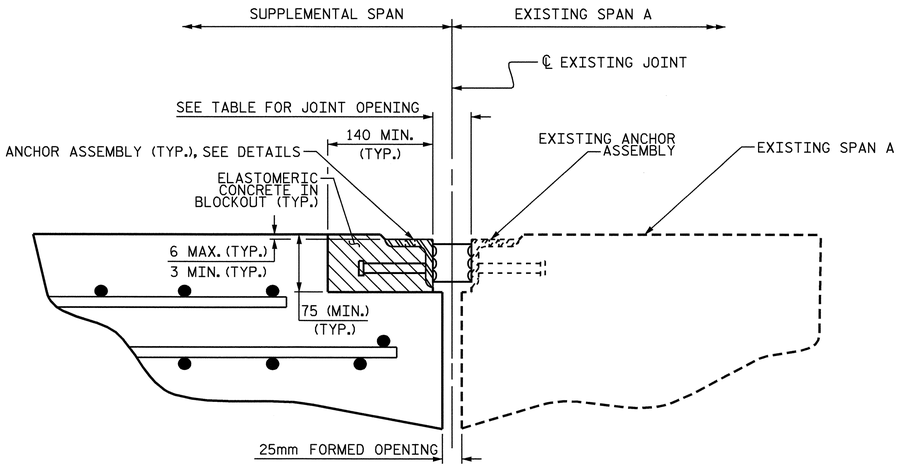
SEE SPECIAL PROVISIONS FOR ELASTOMERIC CONCRETE.

SEE SPECIAL PROVISIONS FOR EXISTING EVAZOTE JOINT SEAL @ END BENT #1.

MOVEMENT AND SETTING AT EVAZOTE JOINT

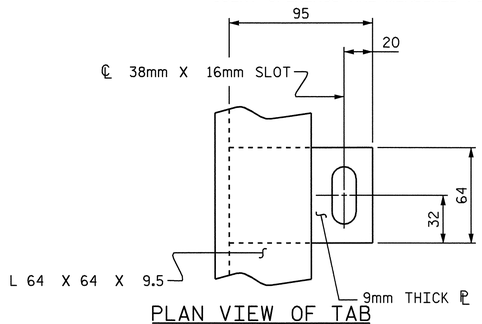
BENT TYPE	SKEW ANGLE	NOMINAL UNCOMPRESSED SEAL WIDTH	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 0° C	PERPENDICULAR JOINT OPENING AT 16° C	PERPENDICULAR JOINT OPENING AT 32° C
RELOCATED END BENT	135°-00'-00"	64mm	7mm	53mm	51mm	47mm
EXISTING END BENT	135°-00'-00"	71mm	26mm	53mm	43mm	33mm

TOTAL MOVEMENT IS CALCULATED ALONG THE CENTERLINE OF ROADWAY.
JOINT OPENINGS ARE MEASURED PERPENDICULAR TO THE JOINT.

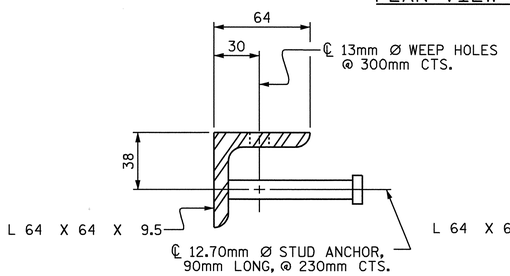


ARMORED JOINT DETAILS

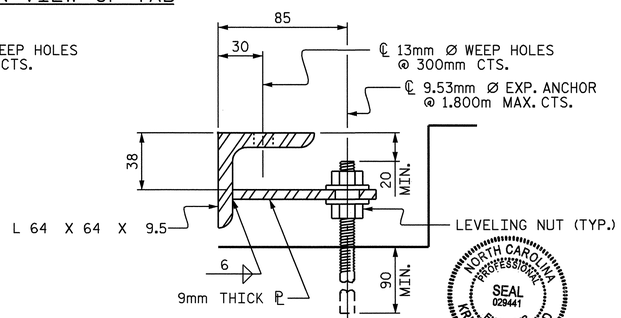
SECTION NORMAL TO JOINT AT EXISTING END BENT



PLAN VIEW OF TAB



SECTION VIEW OF STUD



SECTION VIEW OF TAB

BILL OF MATERIAL

BENT TYPE	ELASTOMERIC CONCRETE * (CU. m)	TOTAL LENGTH OF ANGLE (m)
RELOCATED END BENT	0.45	42.5
EXISTING END BENT	0.22	21.3

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

ARMORED JOINT ANCHOR ASSEMBLY DETAILS

PROJECT NO. R-2562AC
CUMBERLAND COUNTY
STATION: 25+36.132-LREV-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD ARMORED EVAZOTE JOINT DETAILS (SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			44

ASSEMBLED BY : T.L. CLELLAND	DATE : 5/15/06		
CHECKED BY : K.W. ALFORD	DATE : 5/25/06		
DRAWN BY : EEM 1/96	REV. 10/17/00	RWW/LES	
CHECKED BY : RGW 1/96	REV. 7/10/01	LES/RDR	
	REV. 5/7/03RR	RWW/JTE	

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tclelland

STD. NO. AEJ1SM

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tclelland

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS					
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#13	610	540	610	540	840
#16	770	660	770	660	1050
#19	920	790	1190	790	1330
#22	1580	1060			
#25	2080	1390			

REINFORCING BAR SCHEDULE

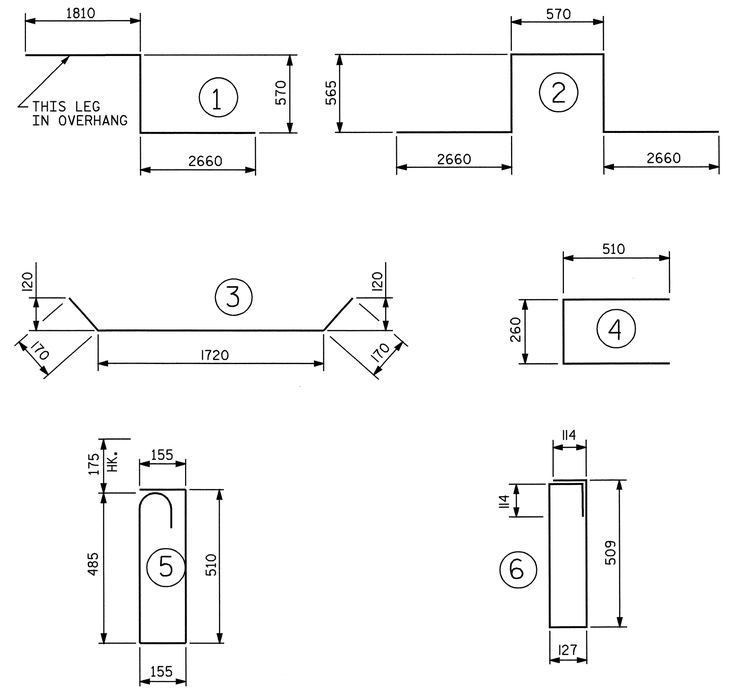
BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	9	#16	STR	14600	204	A136	6	#16	STR	8780	82
A2	9	#16	STR	14600	204	A137	6	#16	STR	8140	76
						A138	6	#16	STR	7600	71
✳ A101	6	#16	STR	14080	131	A139	6	#16	STR	7060	66
✳ A102	6	#16	STR	13540	126	A140	6	#16	STR	6520	61
✳ A103	6	#16	STR	13000	121	A141	6	#16	STR	5980	56
✳ A104	6	#16	STR	12460	116	A142	6	#16	STR	5440	51
✳ A105	6	#16	STR	11920	111	A143	6	#16	STR	4900	46
✳ A106	6	#16	STR	11380	106	A144	6	#16	STR	4360	41
✳ A107	6	#16	STR	10840	101	A145	6	#16	STR	3820	36
✳ A108	6	#16	STR	10300	96	A146	6	#16	STR	3280	31
✳ A109	6	#16	STR	9760	91	A147	6	#16	STR	2740	26
✳ A110	6	#16	STR	9220	86	A148	6	#16	STR	2200	20
✳ A111	6	#16	STR	8780	82	A149	6	#16	STR	1660	15
✳ A112	6	#16	STR	8140	76	A150	6	#16	STR	1120	10
✳ A113	6	#16	STR	7600	71						
✳ A114	6	#16	STR	7060	66	✳ B1	70	#13	STR	7680	534
✳ A115	6	#16	STR	6520	61	B2	56	#16	STR	15040	1307
✳ A116	6	#16	STR	5980	56						
✳ A117	6	#16	STR	5440	51	✳ G1	4	#16	STR	11620	72
✳ A118	6	#16	STR	4900	46						
✳ A119	6	#16	STR	4360	41	✳ K1	36	#19	STR	2660	214
✳ A120	6	#16	STR	3820	36	✳ K2	8	#25	1	5040	160
✳ A121	6	#16	STR	3280	31	✳ K3	20	#25	2	7020	558
✳ A122	6	#16	STR	2740	26	K4	12	#16	3	2060	38
✳ A123	6	#16	STR	2200	20	K5	12	#16	STR	1880	35
✳ A124	6	#16	STR	1660	15						
✳ A125	6	#16	STR	1120	10	✳ S1	42	#13	4	1280	53
						✳ S2	42	#16	5	1480	96
A126	6	#16	STR	14080	131	S3	36	#13	6	1500	54
A127	6	#16	STR	13540	126						
A128	6	#16	STR	13000	121						
A129	6	#16	STR	12460	116						
A130	6	#16	STR	11920	111						
A131	6	#16	STR	11380	106						
A132	6	#16	STR	10840	101						
A133	6	#16	STR	10300	96						
A134	6	#16	STR	9760	91						
A135	6	#16	STR	9220	86						

REINFORCING STEEL = 3411 KG

✳ EPOXY COATED REINF. STEEL = 3664 KG

BAR TYPES

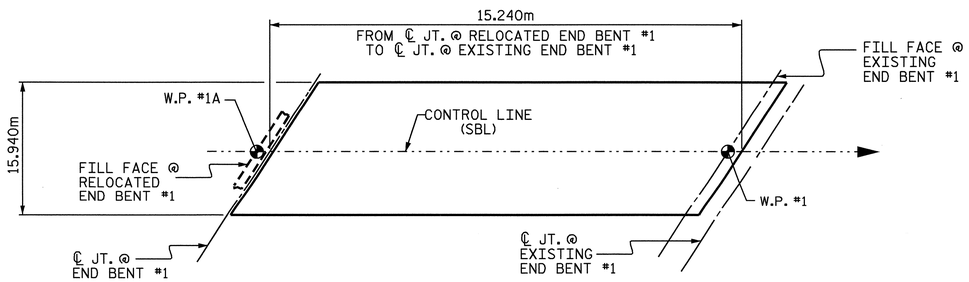


ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. METER)	(kg)	(kg)
SUPPLEMENTAL SPAN	65.6	3411	3664
TOTALS ✳✳	65.6	3411	3664

✳✳ QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB
(SQ. METER = 242.9)

GROOVING BRIDGE FLOORS		
BRIDGE DECK	206.5	SQ. METER
APPROACH SLAB	69.1	SQ. METER
TOTAL	275.6	SQ. METER

PROJECT NO. R-2562AC

CUMBERLAND COUNTY

STATION: 25+36.132-LREV-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL (SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD
4/3/06

NORTH CAROLINA PROFESSIONAL SEAL 1 1905 ENGINEER WILLIAM A. DAVIS
11/3/06

DRAWN BY : T.L. CLELLAND DATE : 4/21/06
CHECKED BY : K.W. ALFORD DATE : 5/25/06

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

FOR PILE SPLICE DETAIL, SEE SHEET 3 OF 3.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

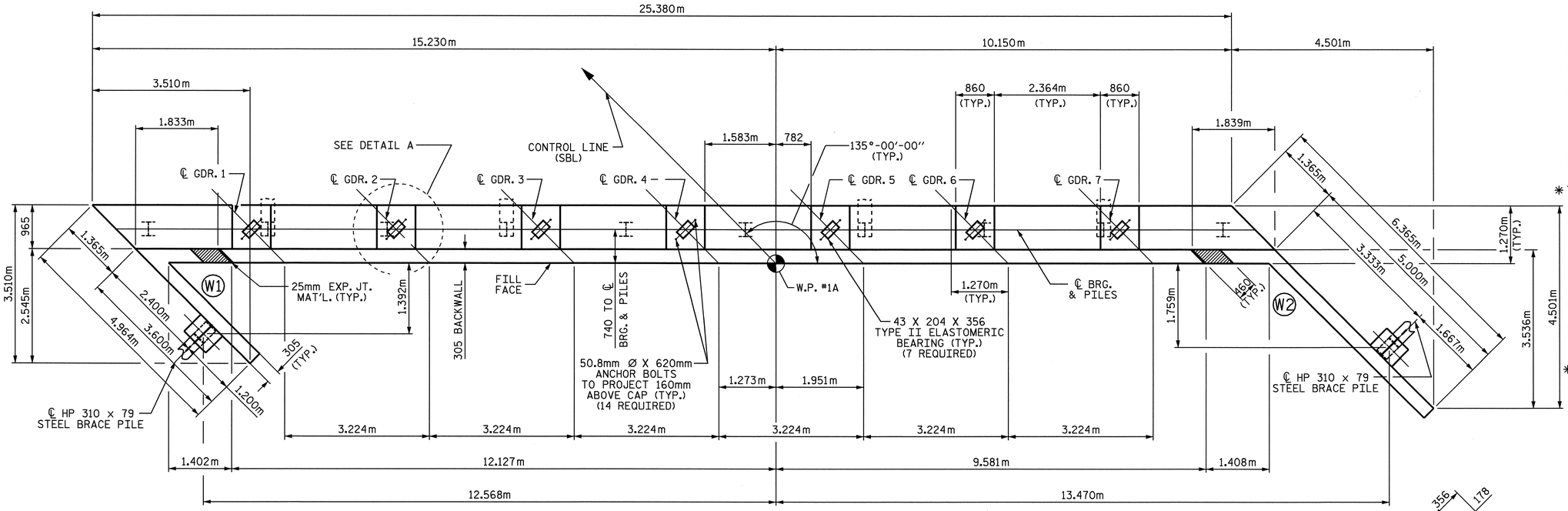
THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

* THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2 %.

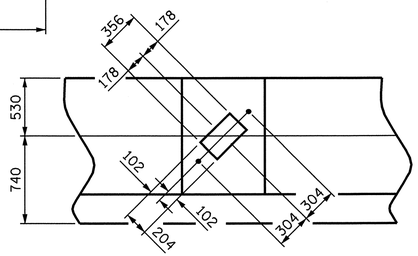
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 102mm Ø DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

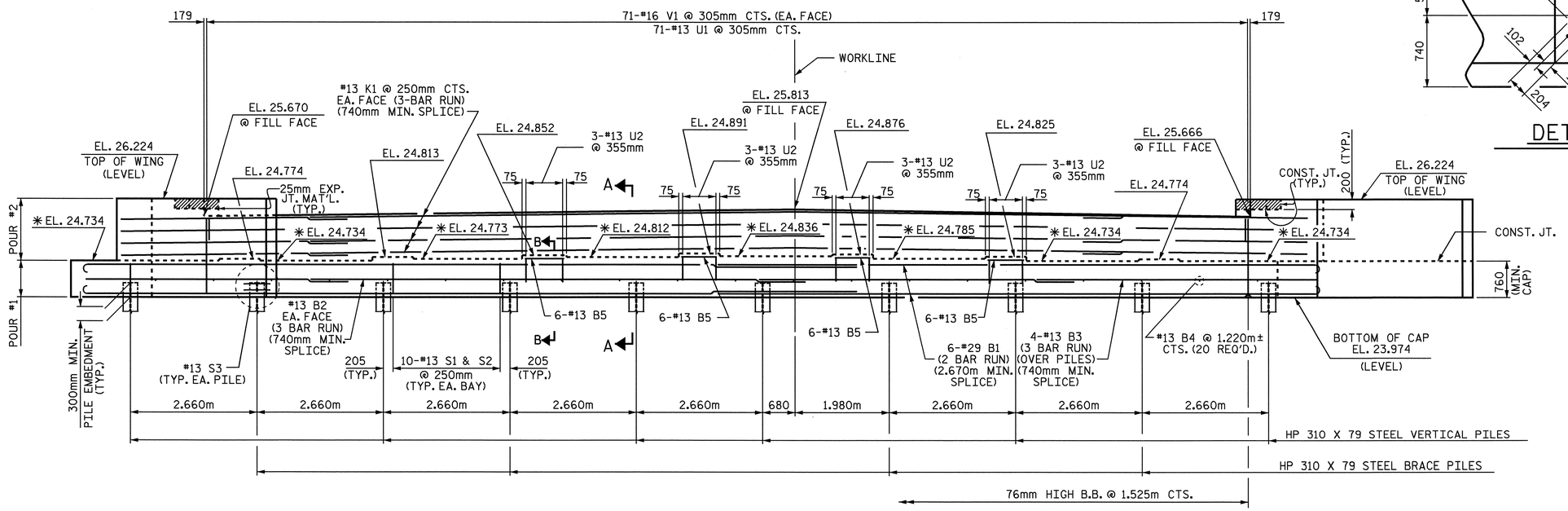
* FOR LOCATION OF ELEVATION SEE SHEET 3 OF 3.



PLAN



DETAIL A



ELELVATION

(WING BRACE PILES NOT SHOWN FOR CLARITY)

PROJECT NO. R-2562AC

CUMBERLAND COUNTY

STATION: 25+36.132-LREV-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE RELOCATED END BENT #1 (SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS
4/3/06

DRAWN BY : T.L. CLELLAND DATE : 5/5/06
CHECKED BY : N.M. RUFFIN DATE : 5/30/06

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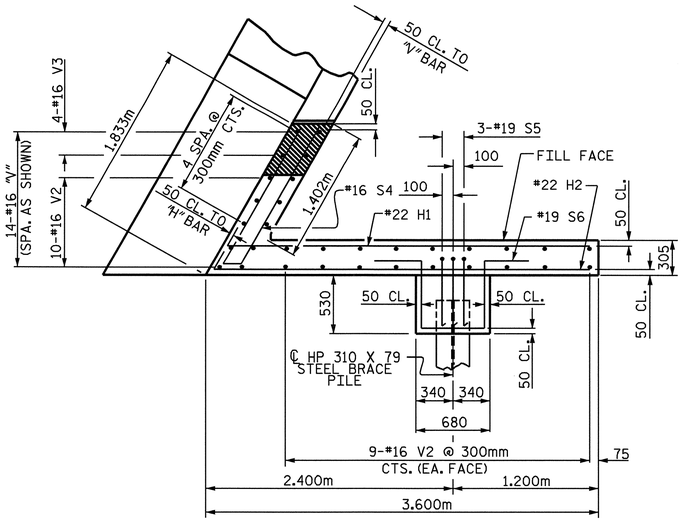
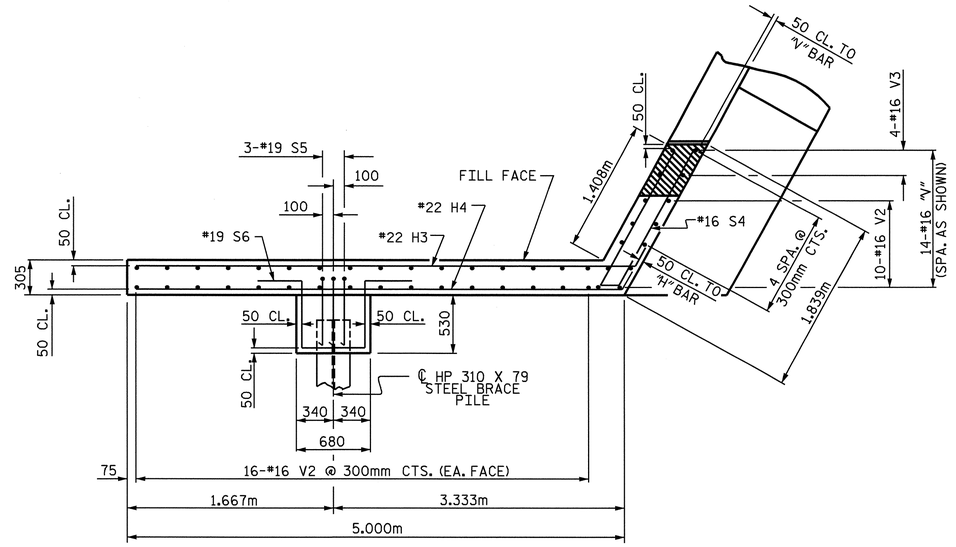
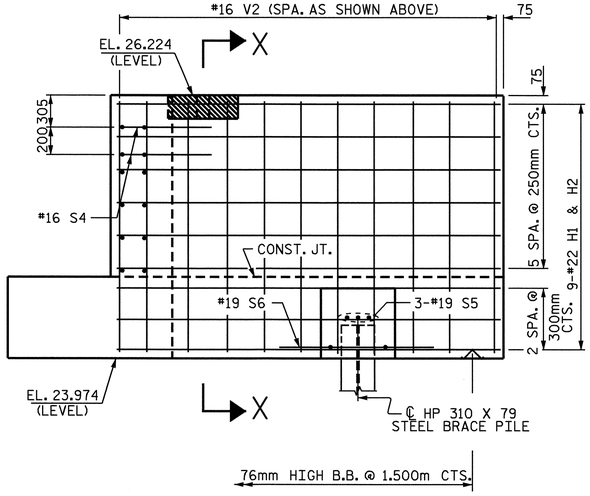


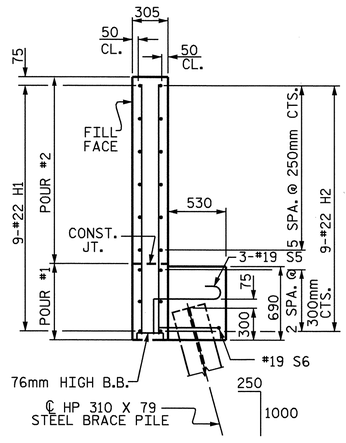
PLAN OF LEFT WING-W1



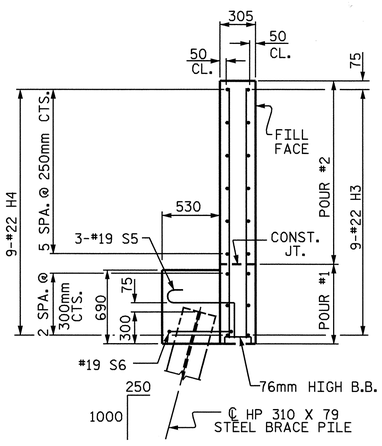
PLAN OF RIGHT WING-W2



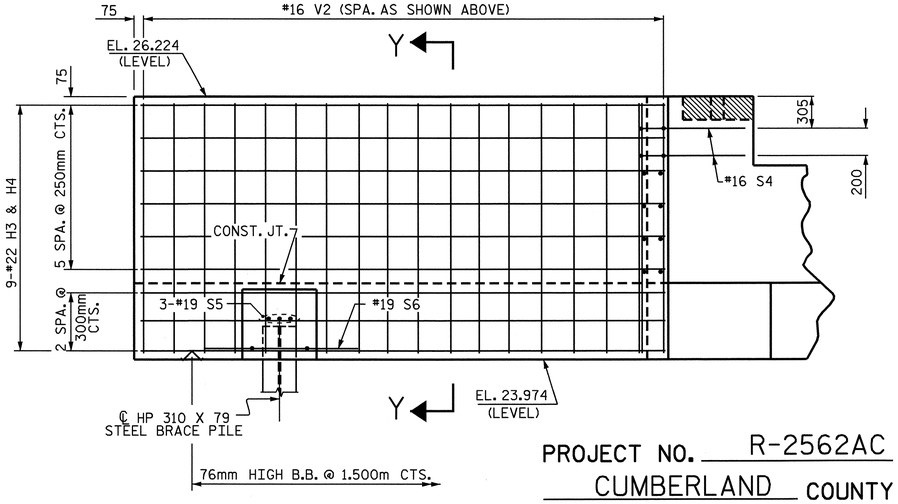
ELEVATION OF LEFT WING-W1



SECTION X-X



SECTION Y-Y



ELEVATION OF RIGHT WING-W2

PROJECT NO. R-2562AC

CUMBERLAND COUNTY

STATION: 25+36.132-LREV-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE RELOCATED END BENT #1 (SBL)

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS
10/24/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			44

DRAWN BY : T.L. CLELLAND DATE : 5/5/06
CHECKED BY : N.M. RUFFIN DATE : 5/31/06

24-OCT-2006 12:29
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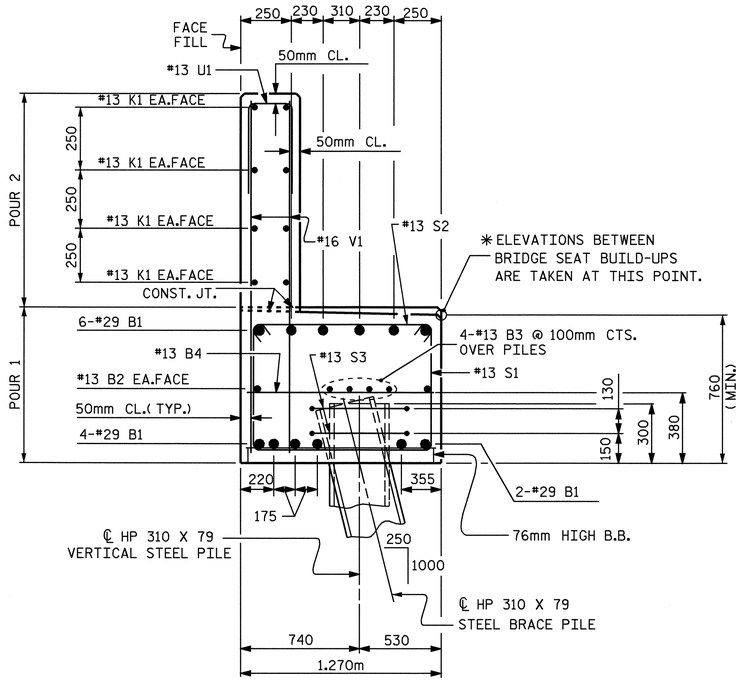
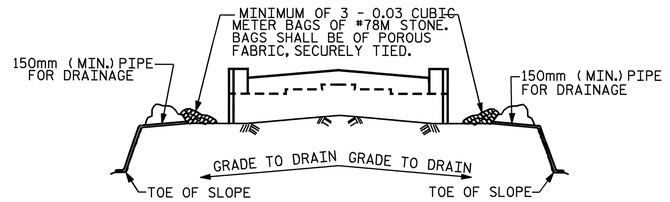


SECTION A-A



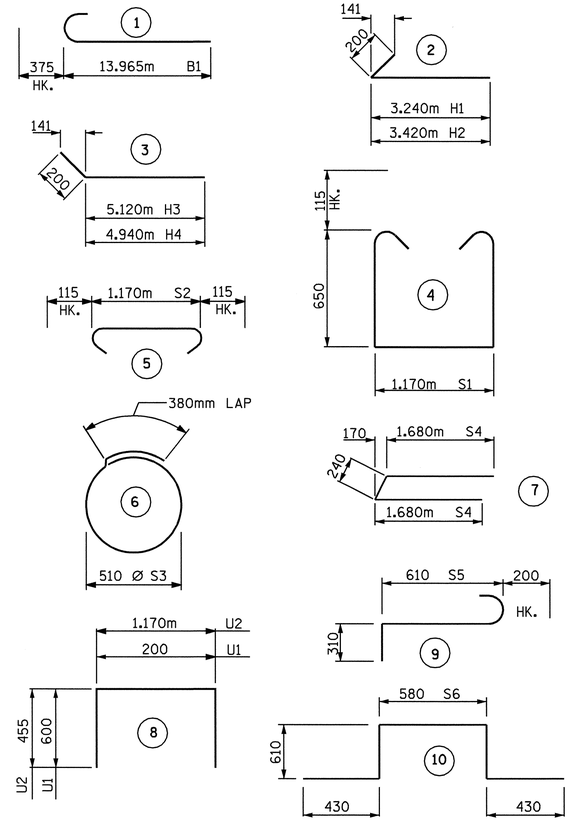
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

END BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	24	29	1	14340	1741
B2	6	13	STR	8920	53
B3	12	13	STR	8920	106
B4	20	13	STR	1160	23
B5	24	13	STR	760	18
H1	9	22	2	3440	94
H2	9	22	2	3620	99
H3	9	22	3	5320	146
H4	9	22	3	5140	141
K1	24	13	STR	8920	213
S1	90	13	4	2700	242
S2	90	13	5	1400	125
S3	20	13	6	1980	39
S4	4	16	7	3600	22
S5	6	19	9	1120	15
S6	2	19	10	2660	12
U1	71	13	8	1400	99
U2	12	13	8	2080	25
V1	142	16	STR	1600	353
V2	70	16	STR	2120	230
V3	8	16	STR	1920	24

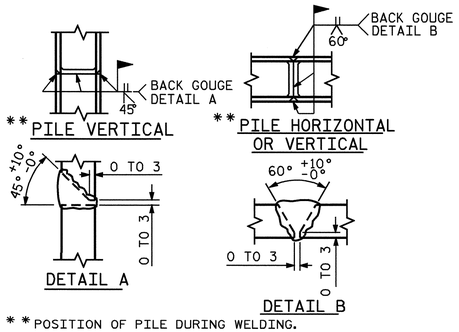
REINFORCING STEEL kg 3820

CLASS "A" CONCRETE

POUR #1 CAP & LOWER WING	27.2m3
POUR #2 BACKWALL & UPPER WING	11.8m3
CLASS "A" CONC. TOTAL	39.0m3

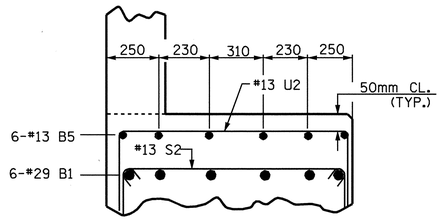
HP 310 X 79 STEEL PILES

NO. 12 LIN. METERS 120.0



** POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



SECTION B-B

PROJECT NO. R-2562AC

CUMBERLAND COUNTY

STATION: 25+36.132-LREV-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE RELOCATED END BENT #1 (SBL)

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS 10/24/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			44

DRAWN BY : T.L. CLELLAND DATE : 5/5/06
CHECKED BY : N.M. RUFFIN DATE : 5/31/06

24-OCT-2006 12:29
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NOTES

THE CROSS-HATCHED AREA ON THE EXISTING END BENT SHALL BE REMOVED AS NOTED ON THE PLANS.

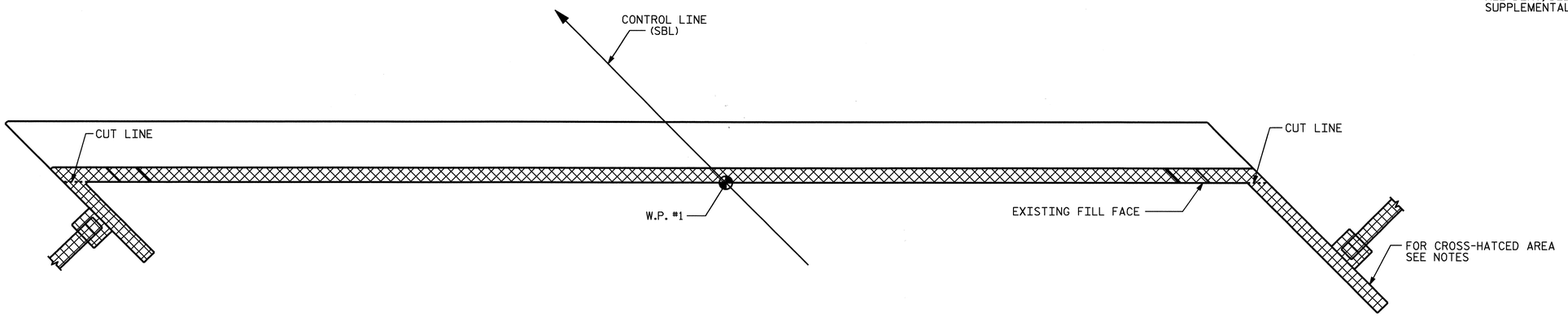
THE EXISTING WINGS AND WING FOOTINGS SHALL BE REMOVED FROM THE EXISTING END BENT CAPS.

THE EXISTING WING BRACE PILE SHALL BE REMOVED BELOW THE GROUND LINE AS DIRECTED BY THE ENGINEER.

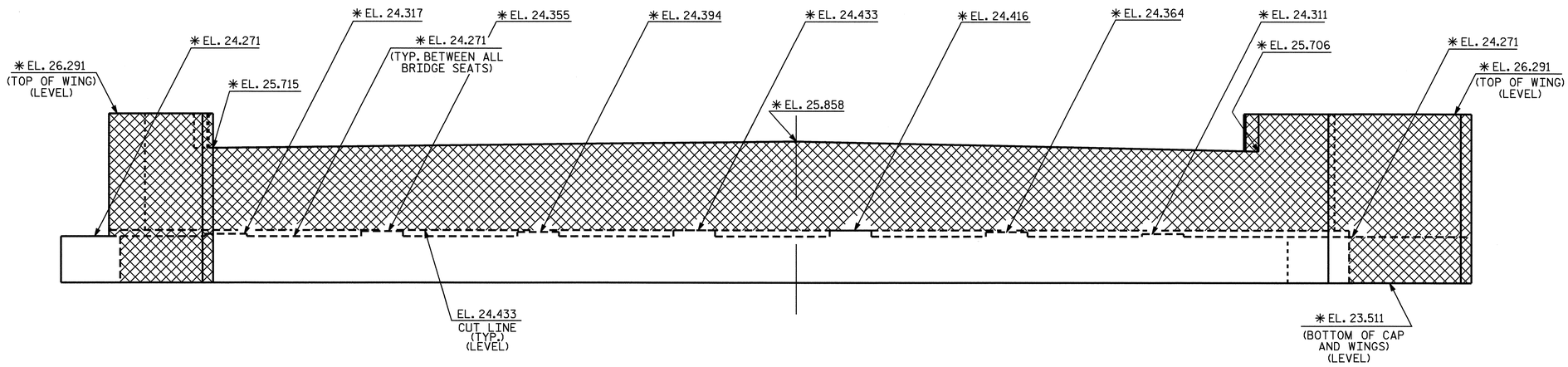
THE EXISTING BACKWALL SHALL BE CUT ALONG INDICATED CUT LINES AND REMOVED AS DIRECTED BY THE ENGINEER.

* ELEVATIONS SHOWN ARE OF THE EXISTING END BENT #1.

CLEAN EXISTING END BENT #1 FILL FACE TO REMOVE ALL DIRT, DEBRIS, GRIME, ETC. BEFORE FORMING SUPPLEMENTAL BENT CAP.



EXISTING PLAN



EXISTING ELEVATION

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS
11/29/06

PROJECT NO. R-2562AC
CUMBERLAND COUNTY
STATION: 25+36.132-LREV-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
EXISTING END BENT #1
(SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			44

DRAWN BY : T.L. CLELLAND DATE : 6/9/06
CHECKED BY : N.M. RUFFIN DATE : 6/22/06

29-NOV-2006 12:06
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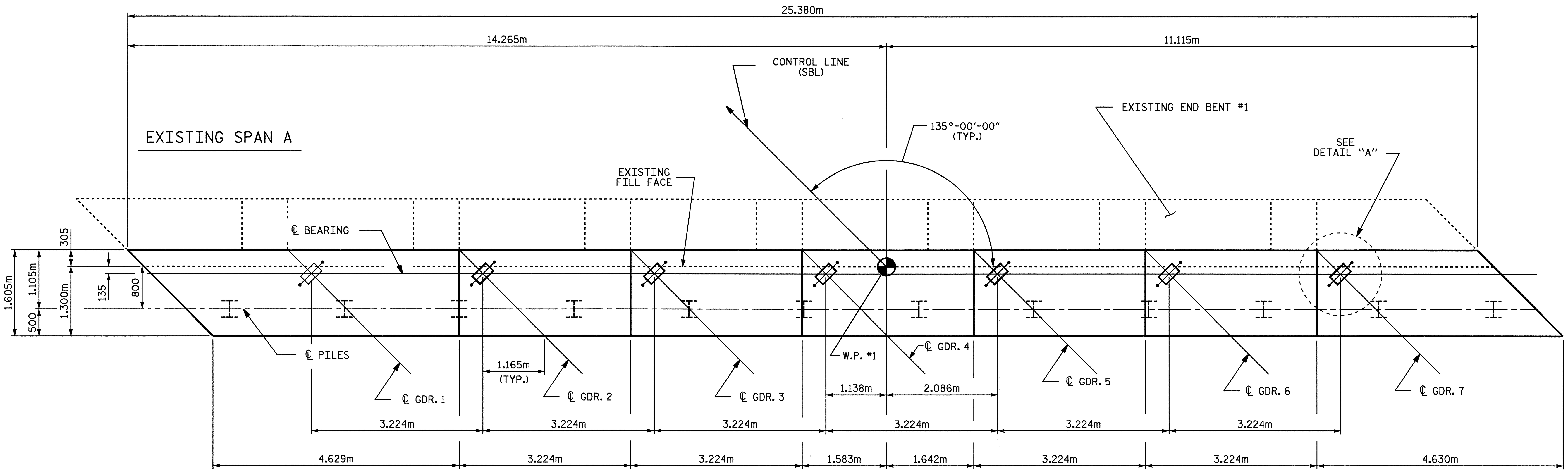
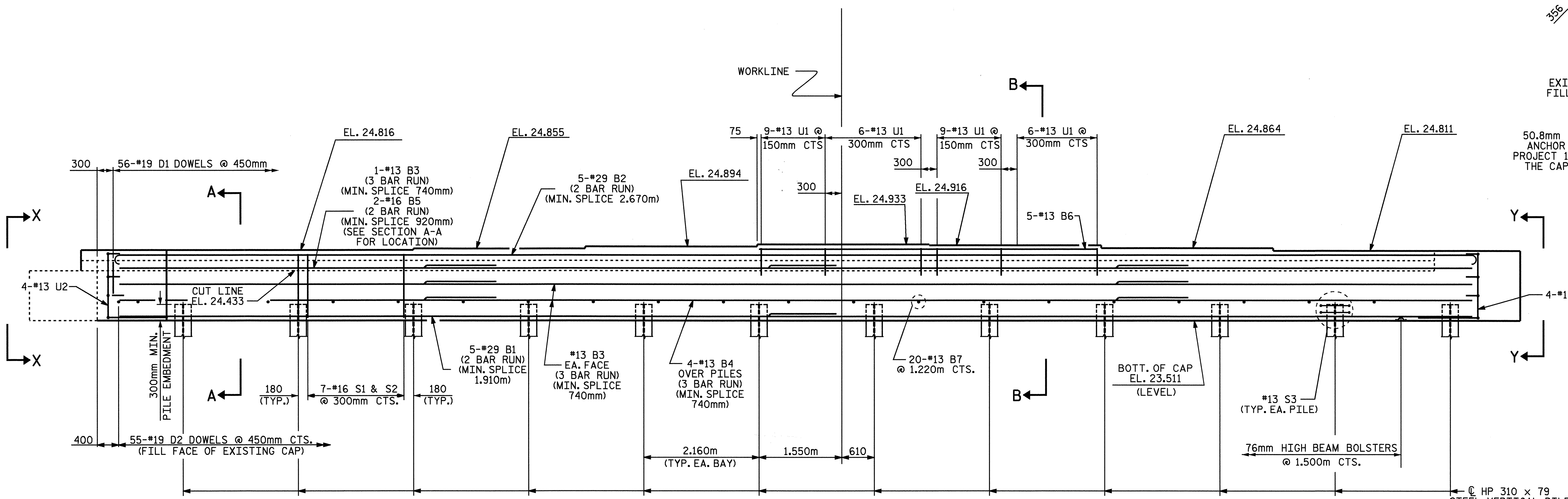


PLAN



ELEVATION

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

FOR PIPE INSERT DETAILS, SEE BEARINGS SHEET.

THE D1 AND D2 DOWELS SHALL BE LOCATED FROM THE EXISTING CAP FILL FACE, AND MAY BE SHIFTED AS NECESSARY TO MISS EXISTING CAP STEEL.

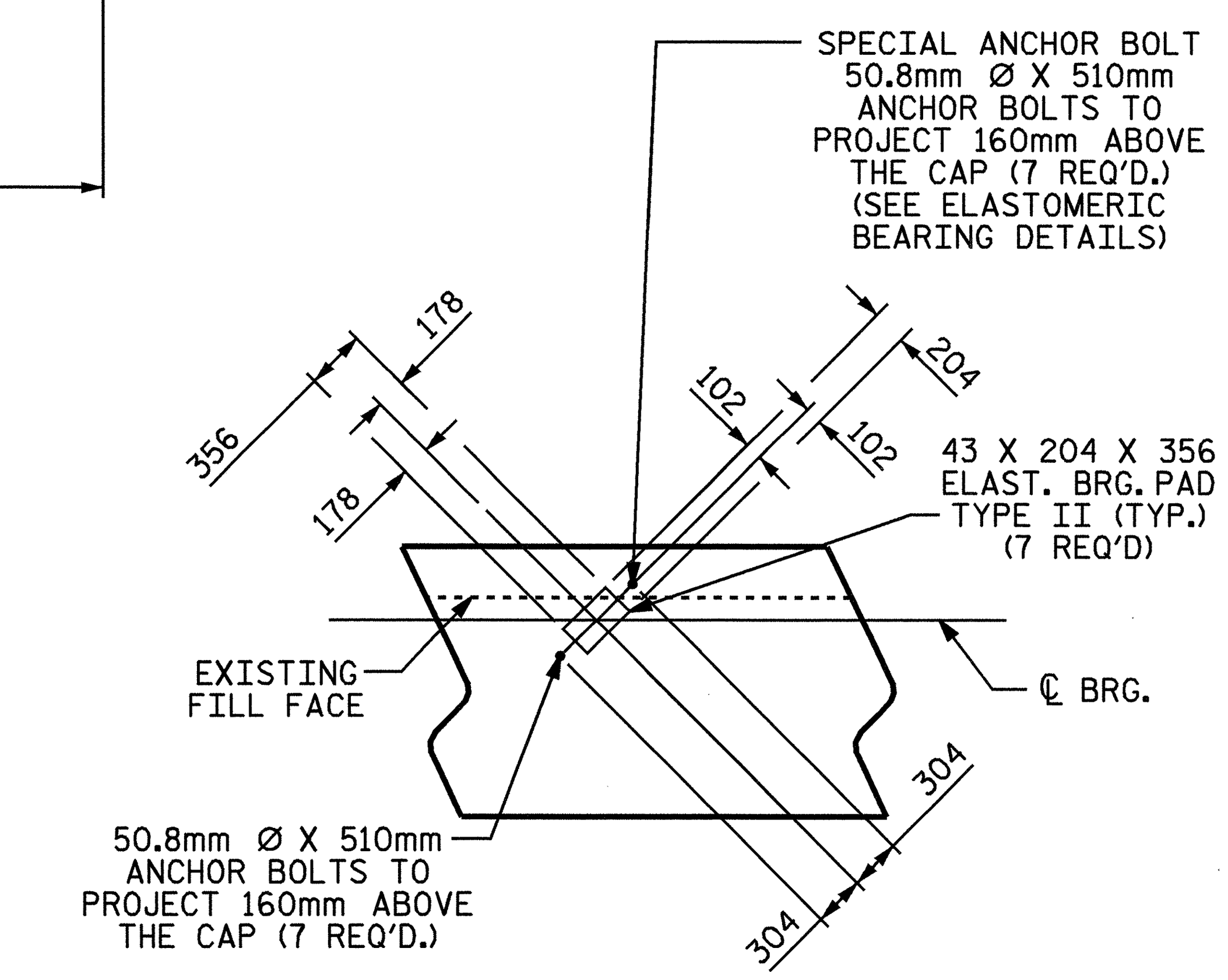
THE D1 AND D2 DOWELS SHALL BE ADHESIVELY ANCHORED.

FOR THE ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS.

FOR GALVANIZING STEEL PILES, SEE SPECIAL PROVISIONS.

THE EXISTING PILES SHALL BE CLEANED AND PAINTED. SEE SPECIAL PROVISION FOR "CLEANING AND PAINTING EXISTING STEEL PILES."

THE SUPPLEMENTAL PILES SHALL BE GALVANIZED. SEE SPECIAL PROVISION FOR "GALVANIZING STEEL PILES."



DETAIL "A"

PROJECT NO. R-2562AC

CUMBERLAND COUNTY

STATION: 25+36.132 -LREV-

SHEET 1 OF 2

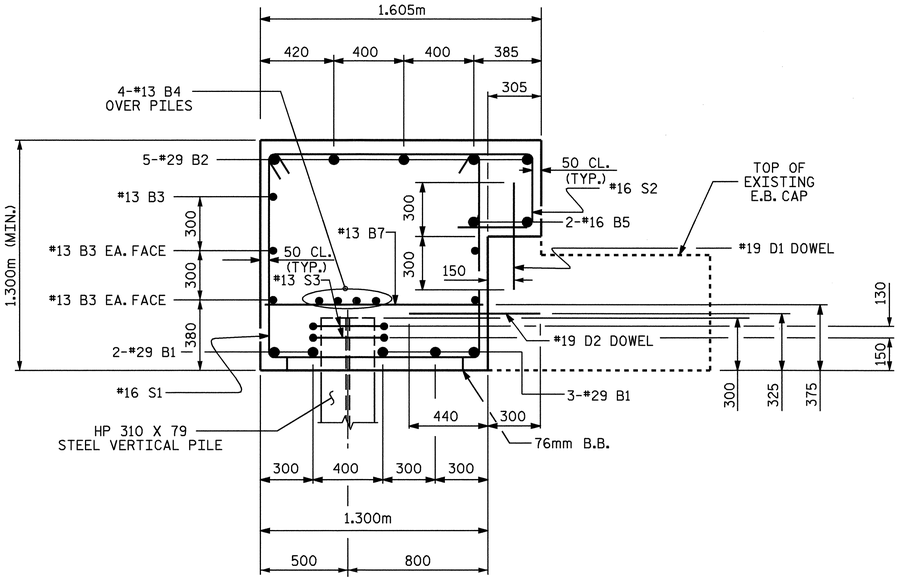
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
SUPPLEMENTAL BENT @ EXISTING END BENT #1
(SBL)

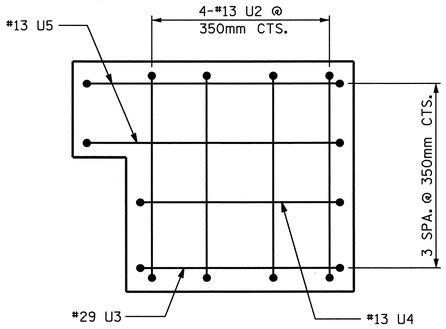
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 11905 WILLIAM A. DAVIS
11/29/06

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			S-18
1			3					TOTAL SHEETS
2			4					44

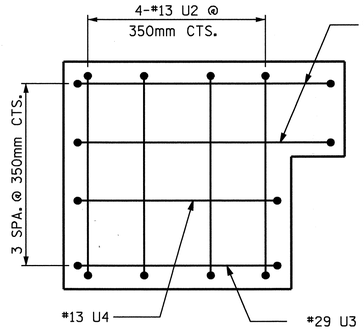
DRAWN BY : T.L. CLELLAND DATE : 6/9/06
CHECKED BY : N.M. RUFFIN DATE : 6/22/06



SECTION A-A



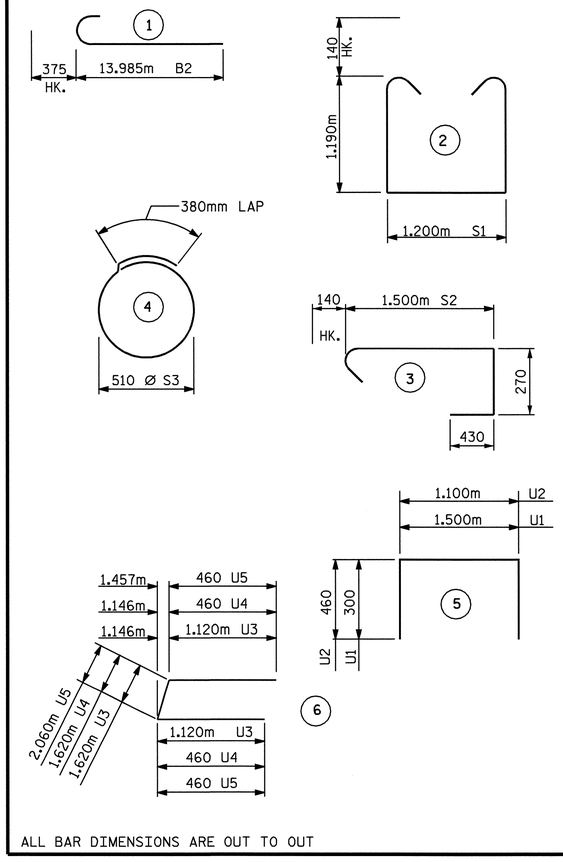
SECTION X-X



SECTION Y-Y

SECTION B-B

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

SUPPLEMENTAL BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#29	STR	13600	688
B2	10	#29	1	14360	727
B3	15	#13	STR	8920	133
B4	12	#13	STR	8920	106
B5	4	#16	STR	13100	81
B6	5	#13	STR	6340	32
B7	20	#13	STR	1000	20
D1	56	#19	STR	600	75
D2	55	#19	STR	740	91
S1	77	#16	2	3860	461
S2	77	#16	3	2340	280
S3	24	#13	4	1980	47
U1	30	#13	5	2100	63
U2	8	#13	5	2020	16
U3	2	#13	6	3860	8
U4	2	#13	6	2540	5
U5	4	#13	6	2980	12

REINFORCING STEEL = 2845 KG

CLASS "A" CONCRETE

POUR #1 CAP 48.0m³

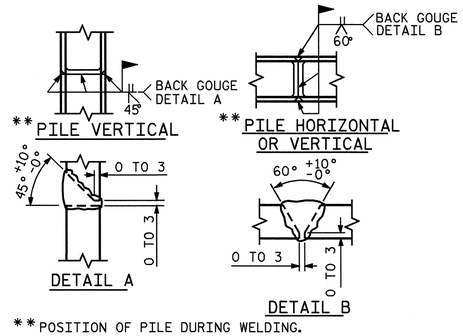
CLASS "A" CONC. TOTAL 48.0m³

HP 310 X 79 STEEL PILES

NO. 12 LIN. METERS 120.0

GALVANIZING STEEL PILES

LUMP SUM



** POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

PROJECT NO. R-2562AC

CUMBERLAND COUNTY

STATION: 25+36.132-LREV-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
SUPPLEMENTAL BENT @ EXISTING END BENT #1
(SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS 11/29/06

DRAWN BY : T.L. CLELLAND DATE : 5/5/06
CHECKED BY : N.M. RUFFIN DATE : 6/22/06

29-NOV-2006 12:07
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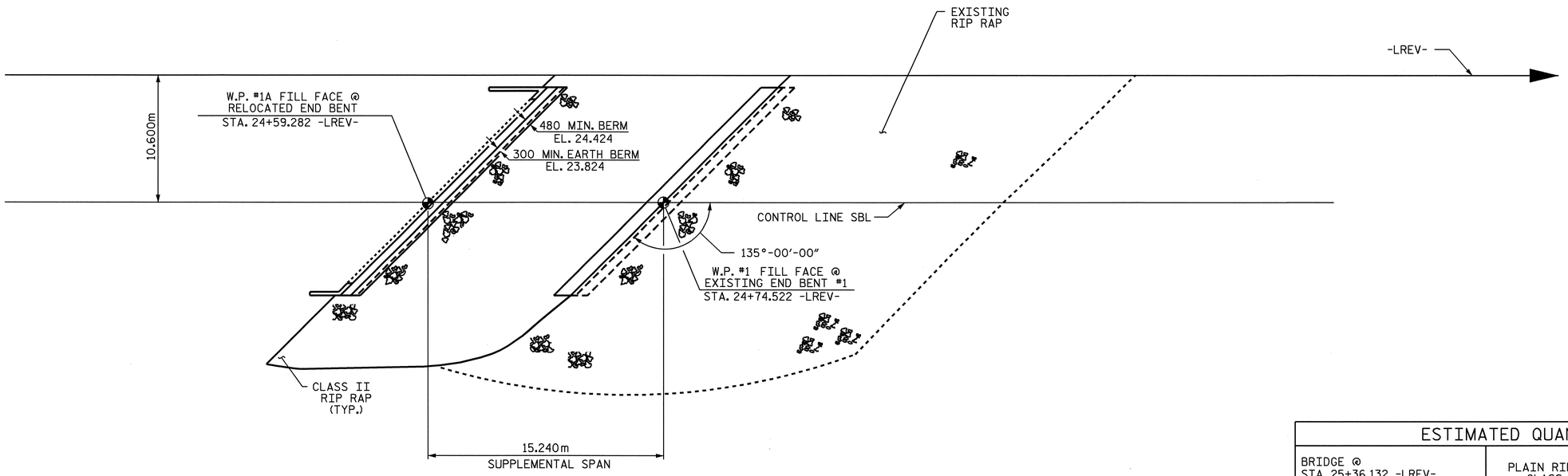
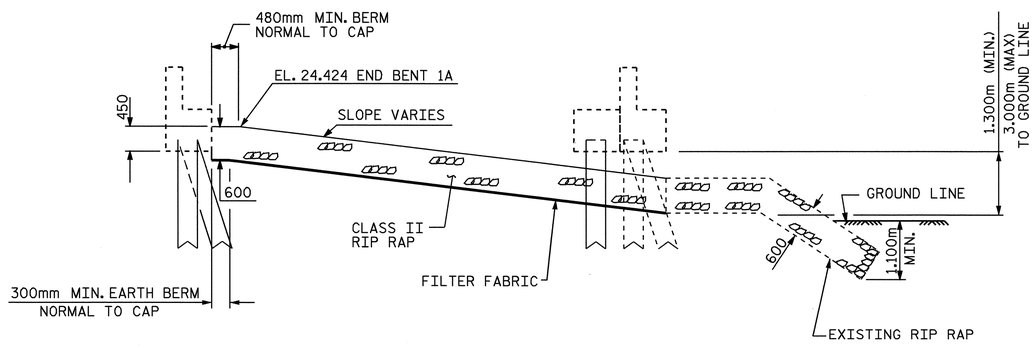


PLAN

ESTIMATED QUANTITIES		
BRIDGE @ STA. 25+36.132 -LREV-	PLAIN RIP RAP CLASS II	FILTER FABRIC FOR DRAINAGE
	METRIC TON	SQUARE METERS
END BENT 1	67	68



RELOCATED END BENT EXISTING END BENT

℄ SECTION
BERM RIP RAPPED

PROJECT NO. R-2562AC
CUMBERLAND COUNTY
STATION: 25+36.132 -LREV-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
RIP RAP DETAILS
(SBL)

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS 11/3/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			44

ASSEMBLED BY : J.L. WALTON DATE : 4/06
CHECKED BY : T.L. CLELLAND DATE : 5/06

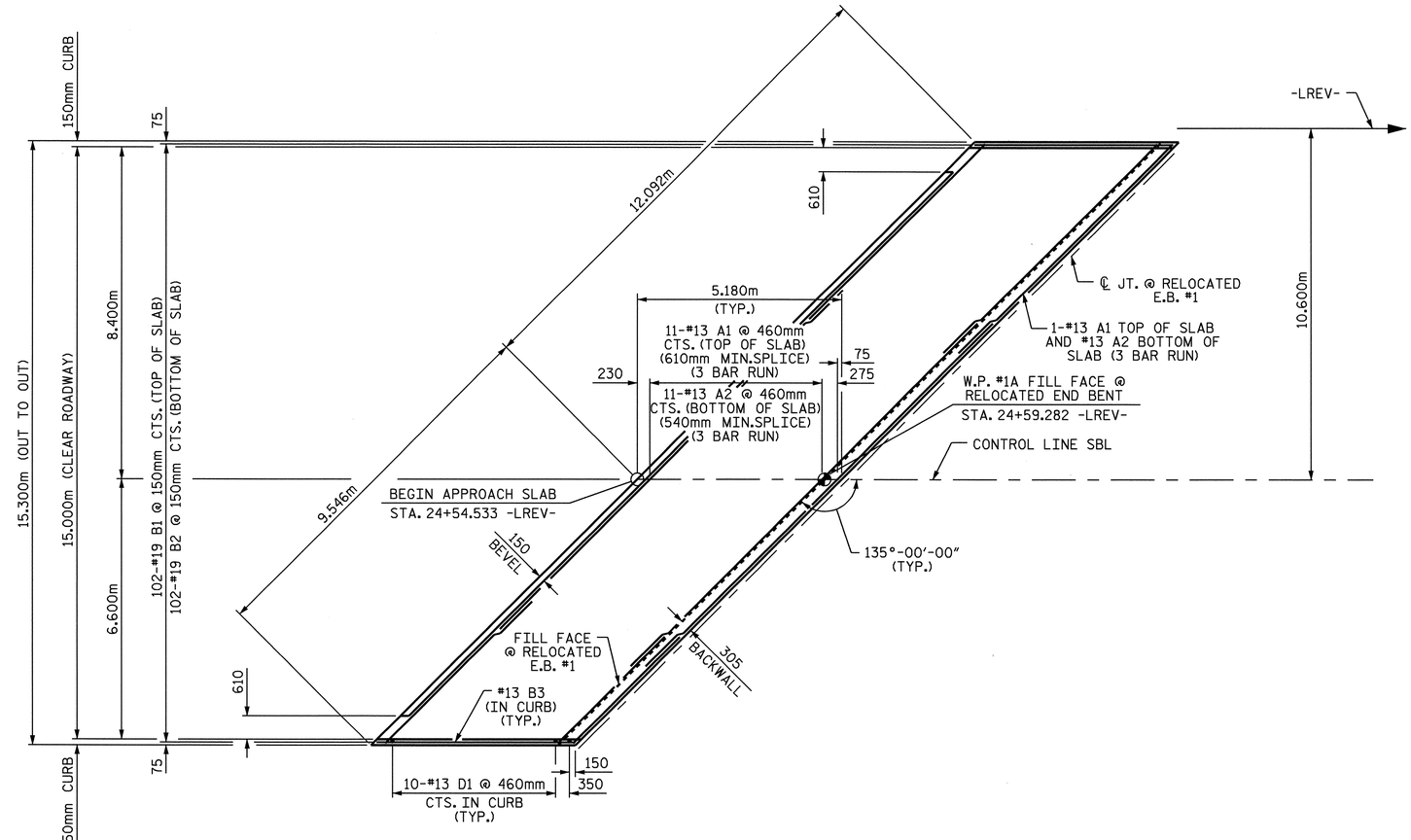
DRAWN BY : REK 1/84
CHECKED BY : RDU 1/84

REV. 7/17/98 REK/RWW
REV. 8/16/99 RWW/LES
REV. 10/17/00 RWW/LES

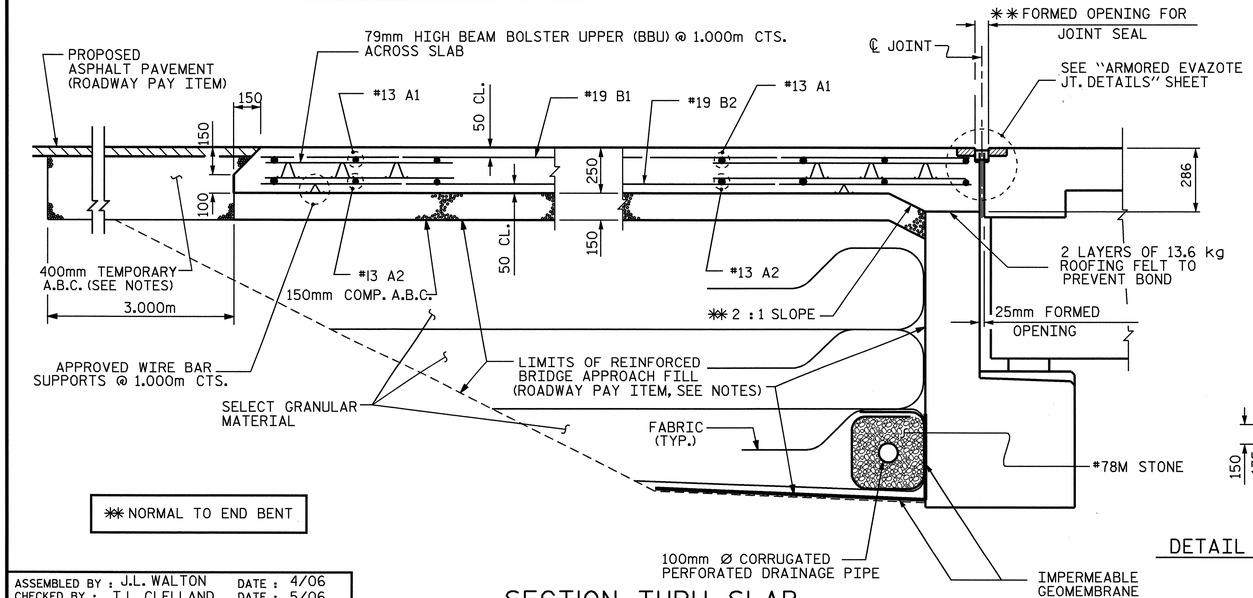
02-NOV-2006 14:27
S:\PG4\squadh\R-2562AC\jwalton\R-2562AC_sd_RR_sb.dgn
tclelland

SKEW > 90°

STD. NO. RR3SM

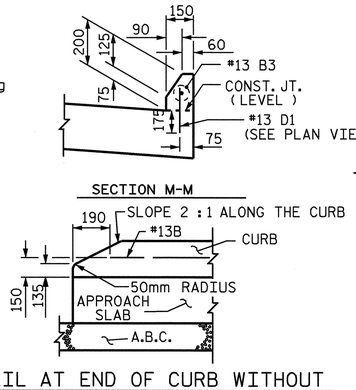


PLAN OF APPROACH SLAB @ E.B. #1

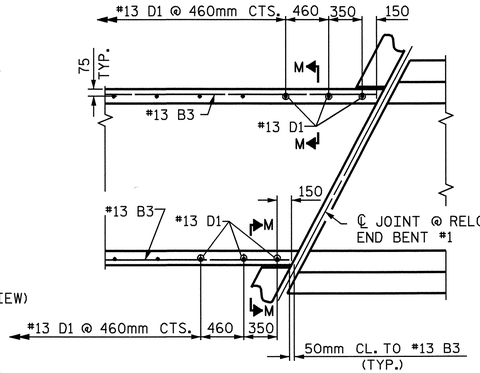


✱✱ NORMAL TO END BENT

SECTION THRU SLAB



DETAIL AT END OF CURB WITHOUT SPECIAL DRAINAGE



PLAN

CURB DETAILS

NOTES

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING FABRIC, IMPERMEABLE GEOMEMBRANE, 100mm Ø DRAINAGE PIPE, #78M STONE, AND SELECT GRANULAR FILL, SEE ROADWAY PLANS.

TEMPORARY DRAINAGE AND TEMPORARY BERM AND SLOPE DRAINS WILL BE PAID FOR UNDER THE LUMP SUM PRICE FOR BRIDGE APPROACH SLAB.

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE.

THE AREAS BETWEEN THE WINGWALLS AND THE APPROACH SLABS SHALL BE PAVED, SEE ROADWAY PLANS.

THE 150mm COMP. A.B.C. SHALL EXTEND 300mm OUTSIDE OF EACH EDGE OF THE SLAB.

THE CONTRACTOR MAY, AT HIS OPTION, USE EITHER 100mm TYPE HB ASPHALT CONCRETE BASE COURSE OR 125mm CLASS 'A' CONCRETE IN LIEU OF 150mm A.B.C. IF 125mm CLASS 'A' CONCRETE IS USED, THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 13.6 kg ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE WIDTH OF THE CONCRETE BASE SHALL BE THE SAME WIDTH AS THE APPROACH SLAB. THE APPROACH SLABS SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.

THE 400mm TEMPORARY A.B.C. SHALL EXTEND FROM THE END OF THE APPROACH SLAB TO 3.000m BEYOND THE SLAB AS SHOWN AND SHALL EXTEND TO EACH EDGE OF THE APPROACH SLAB. THE TEMPORARY A.B.C. MAY BE PLACED IN TWO LIFTS. EACH LIFT SHALL BE COMPACTED BY A MINIMUM OF TWO PASSES OF A VIBRATORY ROLLER

DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER THE SLAB HAS BEEN SCREEDED AND FLOAT FINISHED EXCEPT AS NOTED ON THE PLANS.

WITH EVAZOTE JOINT SEAL

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

PAYMENT FOR EVAZOTE JOINT SEALS SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR EVAZOTE JOINT SEALS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 64mm.

BILL OF MATERIAL

APPROACH SLAB @ E.B. #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	36	13	STR	7580	271
A2	36	13	STR	7540	270
✱B1	102	19	STR	4940	1126
B2	102	19	STR	5080	1156
✱B3	2	13	STR	4940	10
✱D1	22	13	STR	260	6

REINFORCING STEEL	kg	1428
EPOXY COATED REINFORCING STEEL	kg	1419
CLASS "AA" CONCRETE	m3	20.8

PROJECT NO. R-2562AC

CUMBERLAND COUNTY

STATION: 25+36.132 -LREV-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

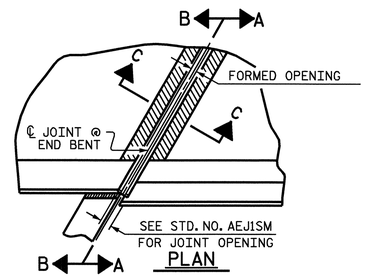
STANDARD
BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT WITH REINFORCED BRIDGE APPROACH FILL (SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			44

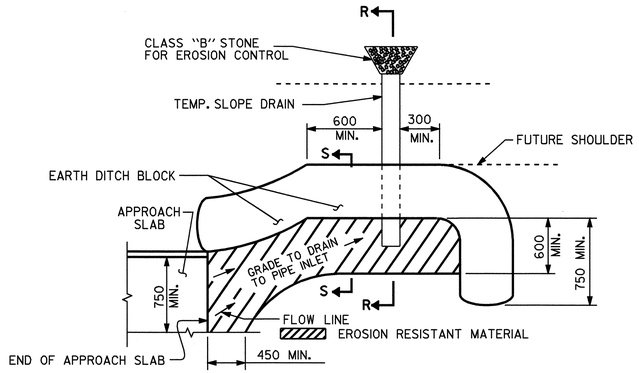
NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS
4/3/06

ASSEMBLED BY : J.L. WALTON	DATE : 4/06
CHECKED BY : T.L. CLELLAND	DATE : 5/06
DRAWN BY : EEM 3/95	REV. 6/16/95 EEM/RGW
CHECKED BY : VAP 3/95	REV. 2/6/97R EEM/RGW

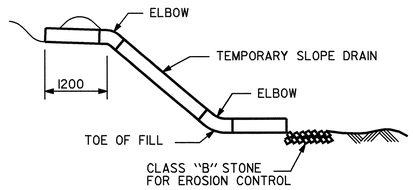
STD. NO. BAS3M



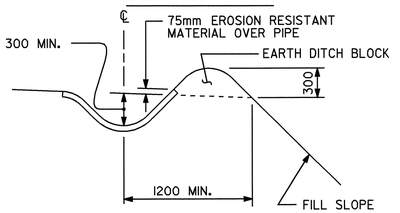
PLAN



NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE I OR TYPE 2, MIN. 50mm DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 305mm IN DIAMETER.



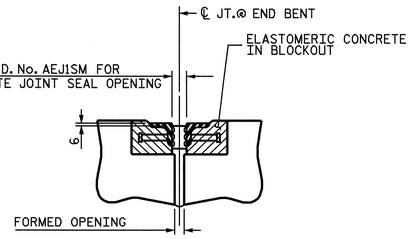
SECTION R-R



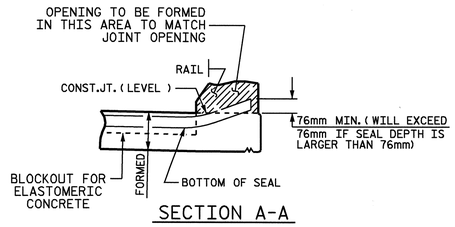
SECTION S-S

PLAN VIEW

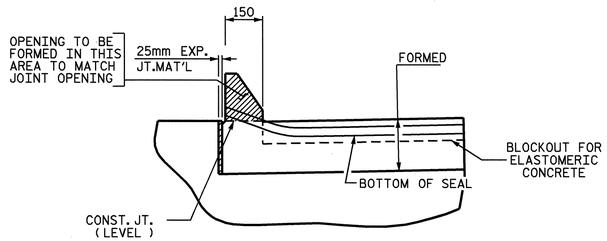
TEMPORARY BERM AND SLOPE DRAIN DETAILS



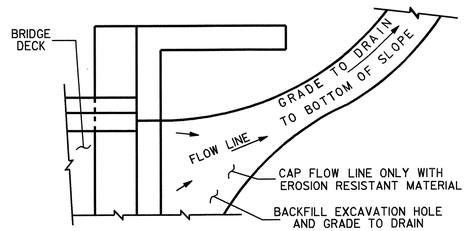
SECTION C-C
ARMORED EVAZOTE JOINT SEAL



SECTION A-A



SECTION B-B



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

TEMPORARY DRAINAGE DETAIL

JOINT SEAL DETAILS @ END BENT

(FOR BARRIER RAIL)

PROJECT NO. R-2562AC

CUMBERLAND COUNTY

STATION: 25+36.132 -LREV-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
BRIDGE APPROACH SLAB DETAILS
(SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM R. DAVIS
11/3/06

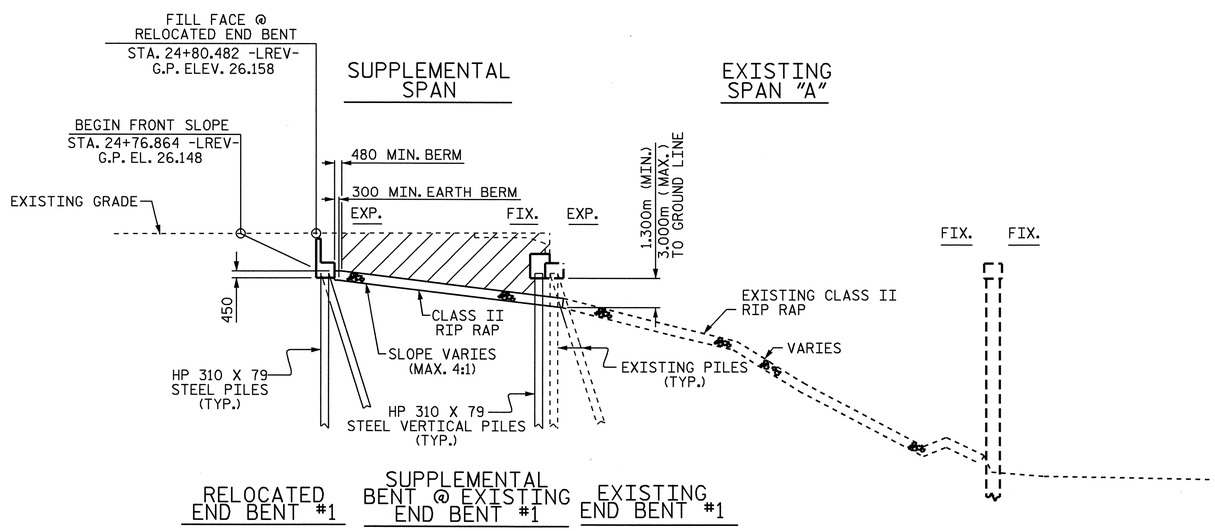
ASSEMBLED BY : J.L. WALTON	DATE : 4/06
CHECKED BY : T.L. CLELLAND	DATE : 5/06
DRAWN BY : FCJ 11/88	REV. 5/16/97 EEM/RGW
CHECKED BY : ARB 11/88	

STD. NO. BAS5SM

24+30 24+40 24+50 24+60 24+70 24+80 24+90 25+00 25+10 25+20 25+30 25+40 25+50 25+60 25+70 25+80 25+90

PVI = 24+20.000 -LREV-
EL. = 25.977
VC = 90m
-0.6520% +0.3000%

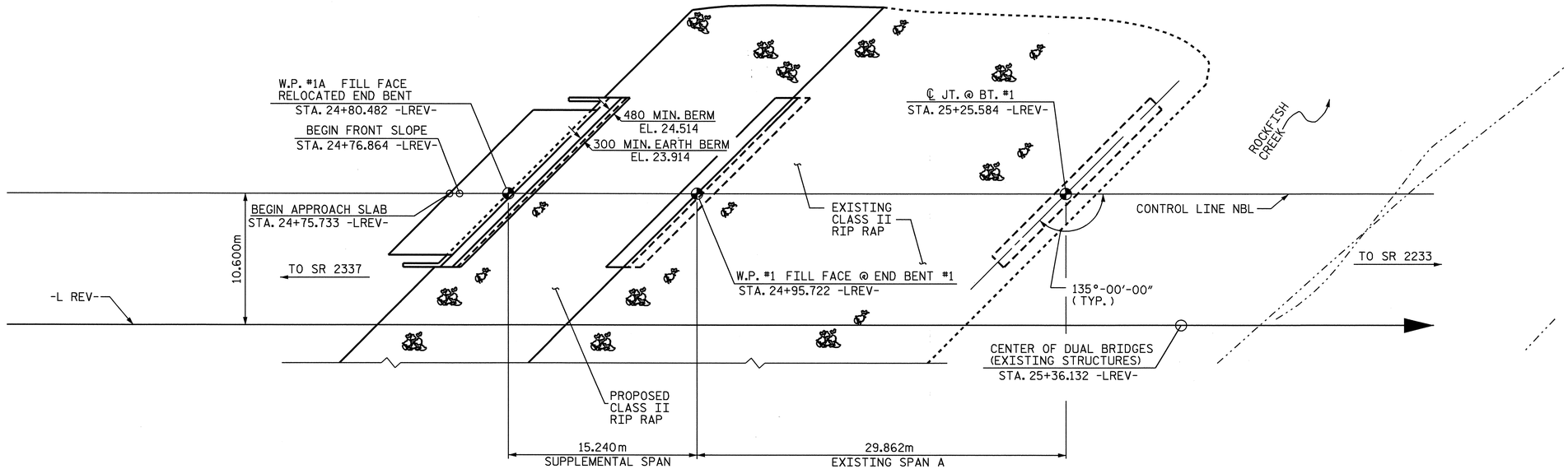
GRADE DATA (NBL)



UNCLASSIFIED STRUCTURE EXCAVATION

SECTION ALONG CONTROL LINE NBL

(SECTIONS @ BENTS AND END BENTS ARE TAKEN @ RIGHT ANGLES)



PLAN

(PILES ARE NOT SHOWN IN PLAN VIEW FOR CLARITY
EXISTING WINGS ARE NOT SHOWN IN PLAN VIEW FOR CLARITY)

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS
11/3/06

DRAWN BY : T.L. CLELLAND DATE : 4/10/06
CHECKED BY : W.A. DAVIS DATE : 5/1/06

METRIC

PROJECT NO. R-2562AC
CUMBERLAND COUNTY
STATION: 25+36.132-LREV-

SHEET 1 OF 3 BRIDGE NO. 21

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

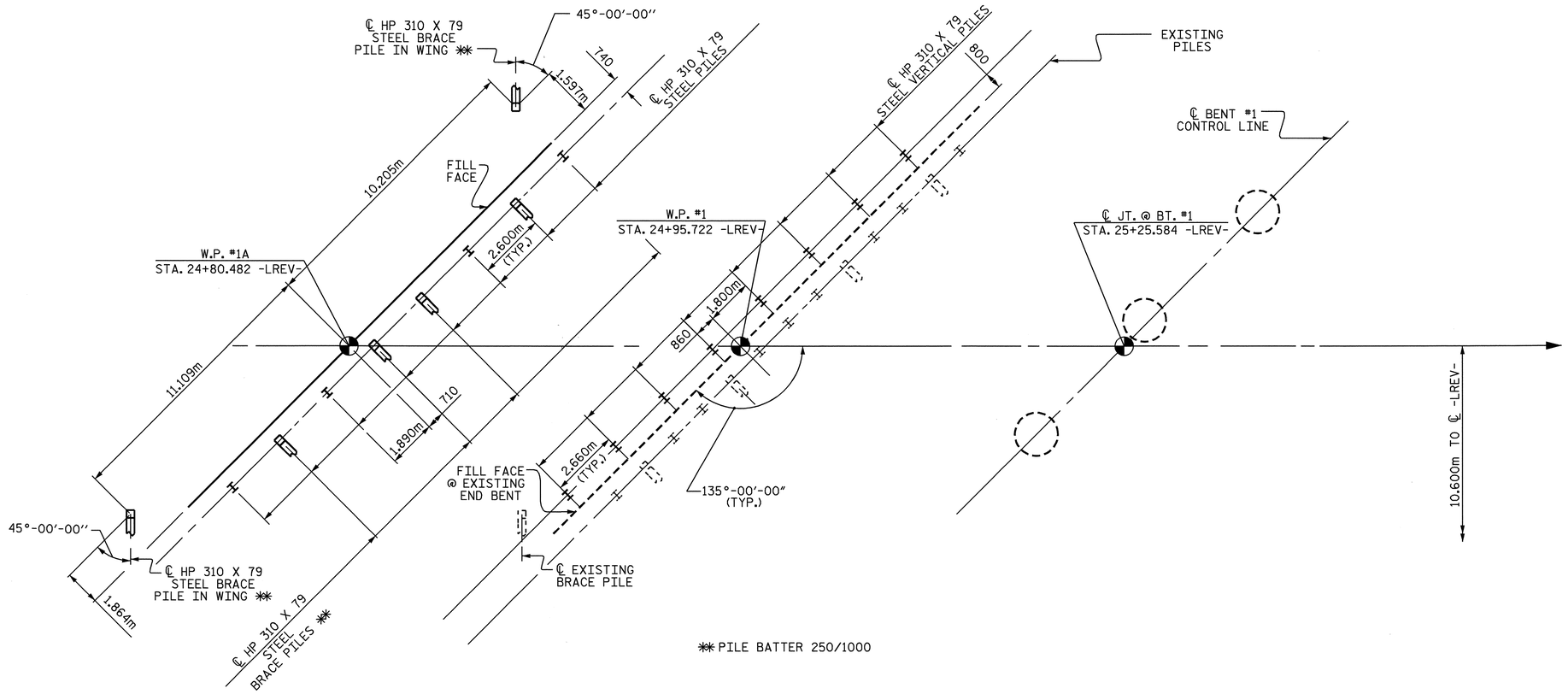
GENERAL DRAWING

BRIDGE ON NC 87 OVER ROCKFISH CREEK BETWEEN SR 2337 AND SR 2233 (NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			44

02-NOV-2006 14:27
S:\PG4\squadh\R-2562AC\tclelland\R-2562AC_sd_GD.dgn

S:\PG4\squadh\R-2562AC\tclelland\R-2562AC_sd_GD.dgn
tclelland



RELOCATED END BENT #1

SUPPLEMENTAL BENT @ EXISTING END BENT #1

EXISTING END BENT #1

EXISTING BENT #1

FOUNDATION LAYOUT

PROJECT NO. R-2562AC

CUMBERLAND COUNTY

STATION: 25+36.132-LREV-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

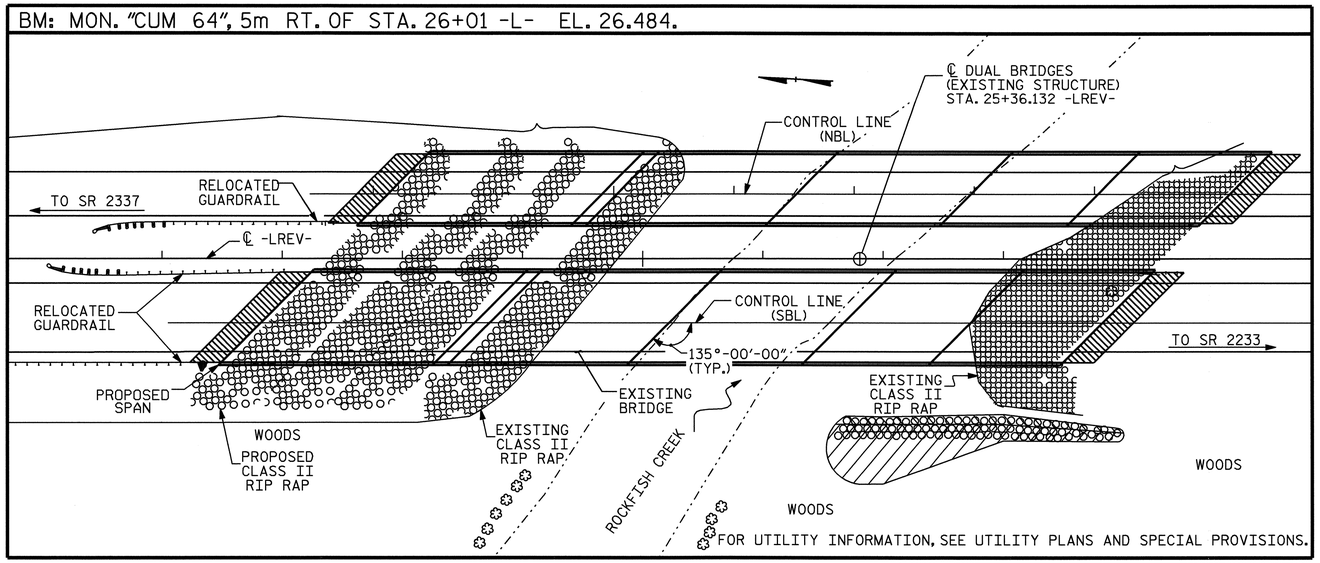
GENERAL DRAWING

BRIDGE ON NC 87 OVER ROCKFISH CREEK BETWEEN SR 2337 AND SR 2233 (NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS
11/3/06

DRAWN BY : T.L. CLELLAND DATE : 4/11/06
CHECKED BY : W.A. DAVIS DATE : 7/11/06



LOCATION SKETCH

HYDROGRAPHIC DATA

DESIGN DISCHARGE_____= 299 m^3/s
FREQUENCY OF DESIGN FLOOD_____ = 50 yr.
DESIGN HIGH WATER ELEVATION_____ = 16.71 m
DRAINAGE AREA_____ = 106.7 sq. km.
BASIC DISCHARGE (Q100)_____ = 369 m^3/s
BASIC HIGH WATER ELEVATION_____= 17.48 m

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE_____= 576+ m^3/s
FREQUENCY OF OVERTOPPING FLOOD_____ = 500+ yr.
OVERTOPPING FLOOD ELEVATION_____= 26.0 m

NOTES:

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

ALL ELEVATIONS ARE IN METERS.

ASSUMED LIVE LOAD = MS 18 OR ALTERNATE LOADING.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET S-NM.

FOR FABRICATED METAL STAY-IN-PLACE FORMS, SEE SPECIAL PROVISIONS.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE "STANDARD SPECIFICATIONS FOR SEISMIC DESIGN OF HIGHWAY BRIDGES" FOR SEISMIC PERFORMANCE CATEGORY A.

REMOVAL OF THE EXISTING STRUCTURE CONSISTS OF: REMOVE THE EXISTING APPROACH SLAB AT END BENT #1. REMOVE THE BACKWALL AND WINGS OF EXISTING END BENT #1 AS SHOWN ON EXISTING END BENT #1 (NBL) SHEET.

THIS BRIDGE HAS BEEN DESIGNED BY THE STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO STANDARD SPECIFICATIONS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 10.000m EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE MEASURED AND PAID FOR AS UNCLASSIFIED STRUCTURE EXCAVATION.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

DRIVE PILES AT RELOCATED END BENT 1 TO A MINIMUM BEARING CAPACITY OF 530 kN EACH.

DRIVE PILES AT SUPPLEMENTAL BENT AT EXISTING END BENT 1 TO AN ELEVATION NO HIGHER THAN 17.3m, AND A MINIMUM BEARING CAPACITY OF 530 kN EACH PLUS CAPACITY TO ACCOUNT FOR DOWN DRAG OR NEGATIVE SKIN FRICTION AND SCOUR.

WHEN DRIVING PILES, DO NOT EXCEED THE MAXIMUM BLOW COUNT.

PROVIDE GALVANIZED STEEL PILES AT SUPPLEMENTAL BENT AT EXISTING END BENT 1, NBL AND SBL, IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS AND THE GALVANIZING STEEL PILES SPECIAL PROVISION.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

CLEAN EXISTING END BENT #1 FILL FACE TO REMOVE ALL DIRT, DEBRIS, GRIME, ETC. BEFORE FORMING AND CASTING SUPPLEMENTAL BENT CAP.

FOR CLEANING AND PAINTING EXISTING STEEL PILES, SEE SPECIAL PROVISIONS.

FOR EXISTING EVAZOTE JOINT SEALS AT END BENT #1, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVSIONS.

FOR METRIC STRUCTURAL STEEL, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR STEEL H PILES, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	914mm PRESTRESSED CONCRETE GIRDERS		HP 310 X 79 STEEL PILES		GALVANIZING STEEL PILES	CONCRETE BARRIER RAIL	PLAIN CLASS II RIP RAP (600mm THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS	CLEANING & PAINTING EXISTING STEEL PILES
	LUMP SUM	CU. METERS	SQ. METERS	SQ. METERS	CU. METERS	LUMP SUM	kg	NO.	METERS	NO.	METERS	LUMP SUM	METERS	SQ. METERS	SQ. METERS	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	LUMP SUM		188.1	205.2		LUMP SUM		5	72.010				30.5			LUMP SUM	LUMP SUM	
RELOCATED END BENT					31.4		3223			10	100			76	77			
SUPPLEMENTAL BENT					38.6		2276			8	80	LUMP SUM						
TOTAL	LUMP SUM	1030	188.1	205.2	70.0	LUMP SUM	5499	5	72.010	18	180	LUMP SUM	30.5	76	77	LUMP SUM	LUMP SUM	LUMP SUM

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS
11/23/06

DRAWN BY : T.L. CLELLAND DATE : 4/11/06
CHECKED BY : W.A. DAVIS DATE : 7/11/06

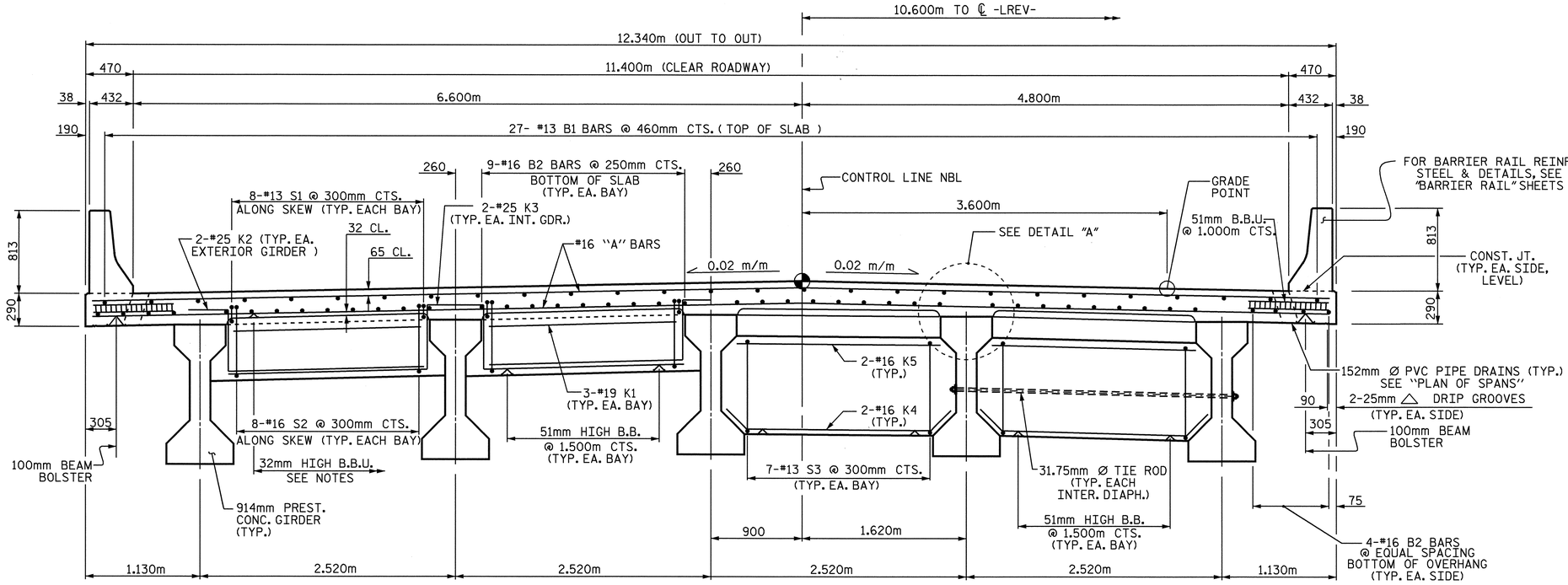
PROJECT NO. R-2562AC
CUMBERLAND COUNTY
STATION: 25+36.132-LREV-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE ON NC 87 OVER ROCKFISH CREEK BETWEEN SR 2337 AND SR 2233
(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			44



PART TYPICAL SECTION
SHOWING END BENT & BENT DIAPHRAGMS

PART TYPICAL SECTION
SHOWING INTERMEDIATE DIAPHRAGMS

NOTES

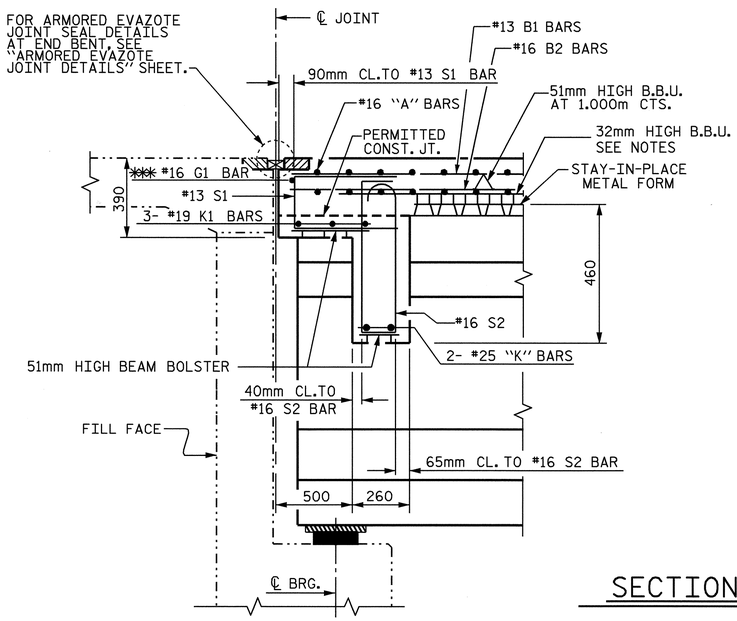
PROVIDE 32mm HIGH BEAM BOLSTERS UPPER AT 1.200m CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 1.200m CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 65mm ABOVE THE TOP OF THE REMOVABLE FORM.

LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY AS NECESSARY TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 20.7 MPa.

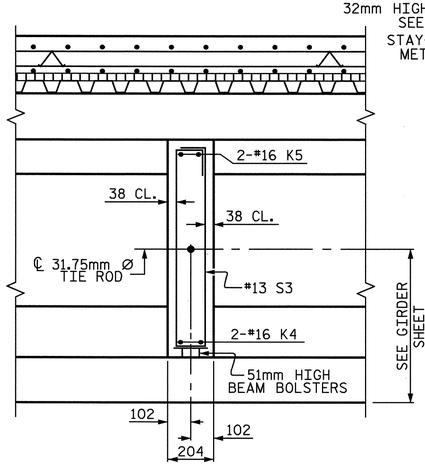
TEMPORARY STRUTS SHALL BE PLACED BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE DIAPHRAGMS, AND THE NUTS ON THE 31.75 MM DIA. TIE RODS SHALL BE FULLY TIGHTENED BEFORE THE DIAPHRAGMS ARE CAST. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED. THE TIE RODS SHALL BE RETIGHTENED AFTER THE STRUTS HAVE BEEN REMOVED.

CONCRETE IN INTERMEDIATE DIAPHRAGMS MAY BE CLASS A IN LIEU OF CLASS AA. PAYMENT SHALL BE MADE UNDER THE UNIT CONTRACT PRICE FOR REINFORCED CONCRETE DECK SLAB.

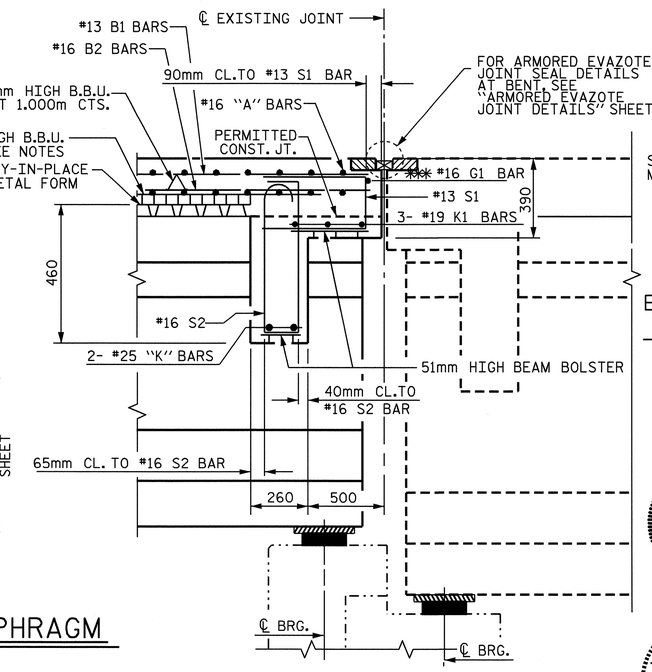


SECTION THRU END BENT DIAPHRAGM

*** #16 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.

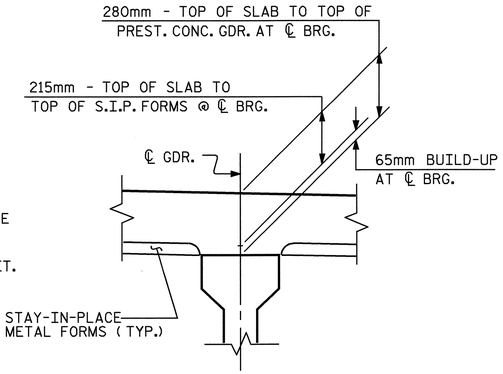


SECTION THRU INTERMEDIATE DIAPHRAGM



SECTION THRU BENT DIAPHRAGM

*** #16 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.



DETAIL "A"

EXISTING SPAN A

PROJECT NO. R-2562AC
CUMBERLAND COUNTY
STATION: 25+36.132-LREV-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

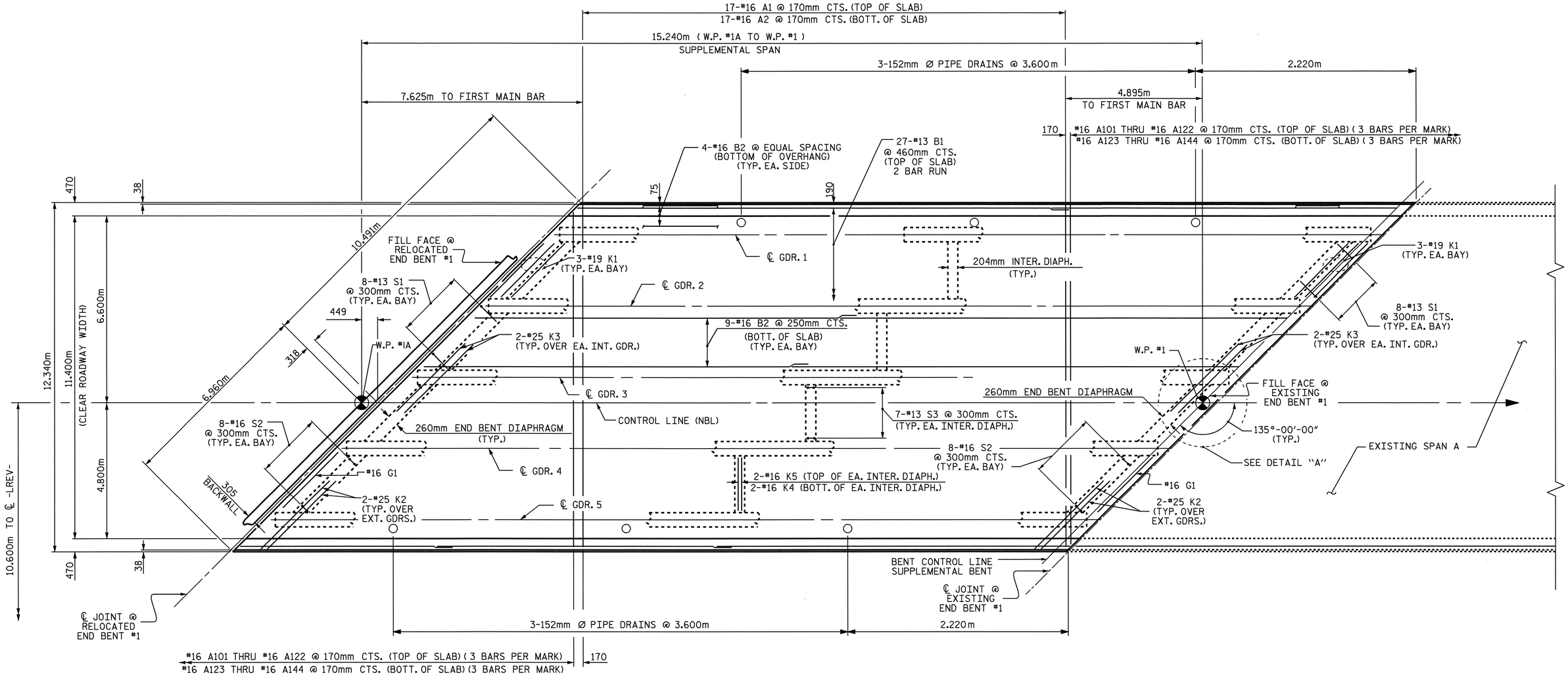
SUPERSTRUCTURE TYPICAL SECTION (NBL)

NORTH CAROLINA PROFESSIONAL SEAL 029447 ENGINEER KRISTY W. ALFORD
10/24/06

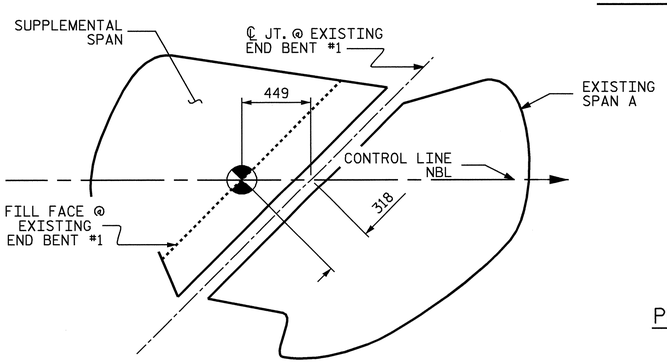
NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. BAYES
10/24/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			44

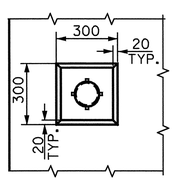
DRAWN BY : T.L.CLELLAND DATE : 4/25/06
CHECKED BY : K.W. ALFORD DATE : 5/26/06



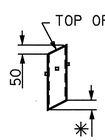
PLAN OF SUPPLEMENTAL SPAN



DETAIL "A"

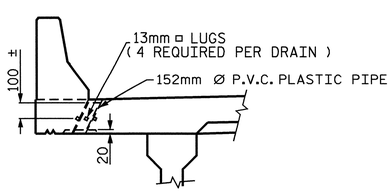


PLAN OF RECESS



* TO BE SET TO MATCH SLOPE OF BOTTOM OF OVERHANG (6 DRAINS REQUIRED)

PIPE DETAIL



ELEVATION

TOP OF FLOOR DRAINS TO SET 10mm BELOW SURFACE OF SLAB.

4 - 13mm □ LUGS TO BE GLUED TO THE P.V.C. PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN.

DRAIN DETAILS

DRAWN BY : T.L.CLELLAND DATE : 4/18/06
CHECKED BY : K.W. ALFORD DATE : 5/30/06

PROJECT NO. R-2562AC
CUMBERLAND COUNTY
STATION: 25+36.132-LREV-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPANS
(NBL)

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIES 11/29/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			44

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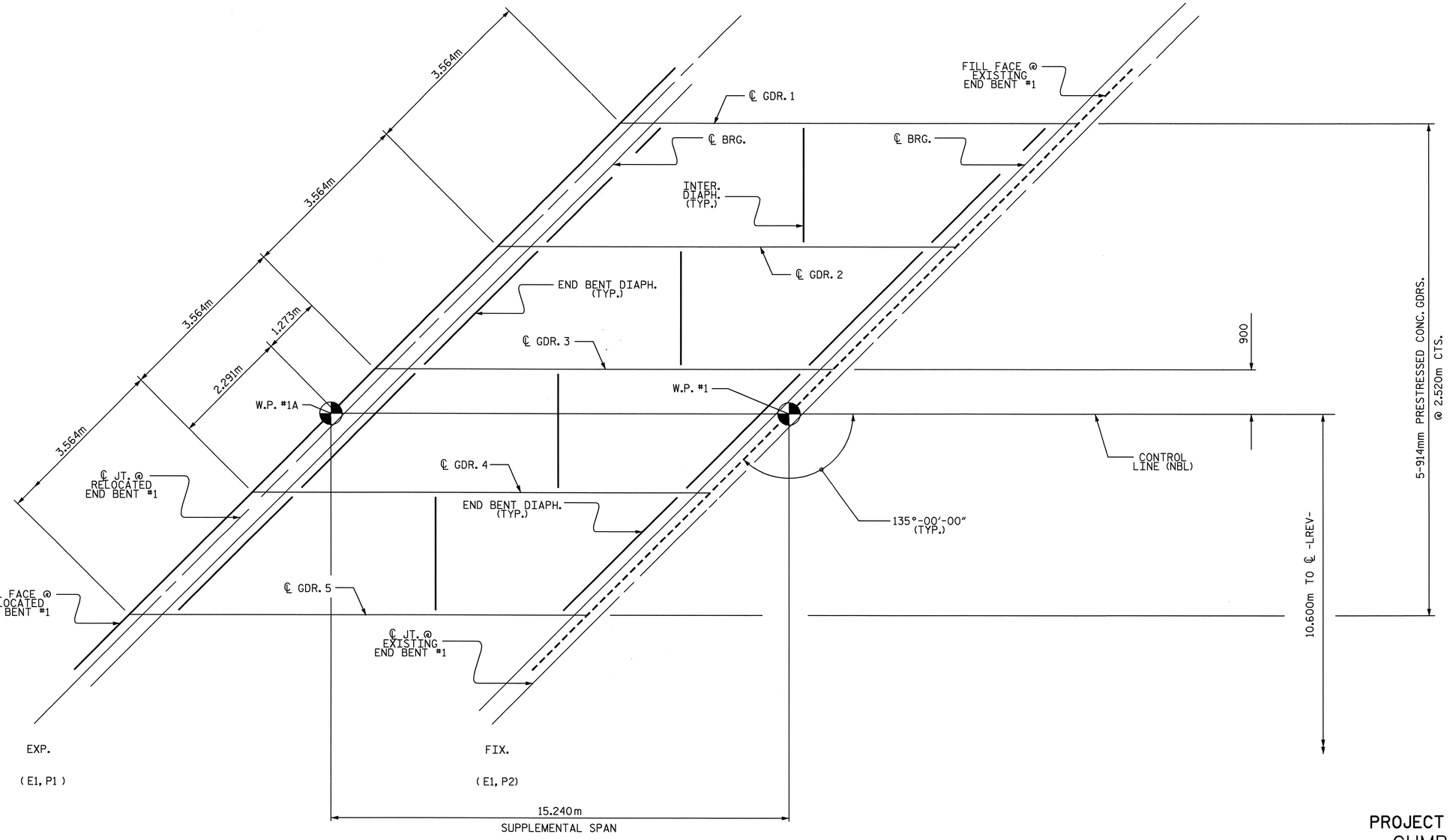
tclelland



GIRDER LAYOUT

PROJECT NO. R-2562AC
CUMBERLAND COUNTY
STATION: 25+36.132-LREV-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

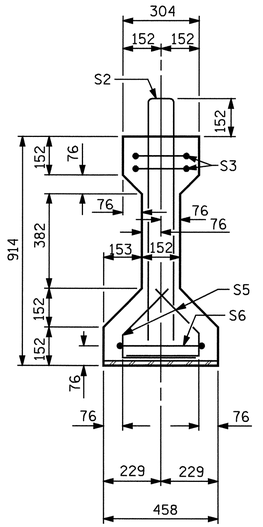
SUPERSTRUCTURE
GIRDER LAYOUT
(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			44

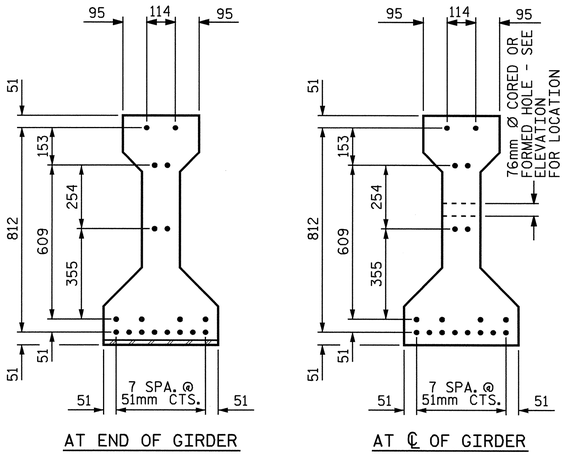
DRAWN BY : T.L. CLELLAND DATE : 4/21/06
CHECKED BY : K.W. ALFORD DATE : 5/30/06

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD 5/30/06

NORTH CAROLINA PROFESSIONAL SEAL 1 1905 ENGINEER WILLIAM A. DAVIS 11/3/06



SECTION A-A



AT END OF GIRDER

AT ℄ OF GIRDER

12.70mm Ø LOW RELAXATION STRAND LAYOUT

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 1860 STRANDS AND SHALL CONFORM TO AASHTO M203M EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

TIE ROD ASSEMBLY SHALL BE AASHTO M270 GRADE 250 STRUCTURAL STEEL.

ALL REINFORCING STEEL SHALL BE GRADE 420.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES.

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE SPECIFICATIONS.

BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.

ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

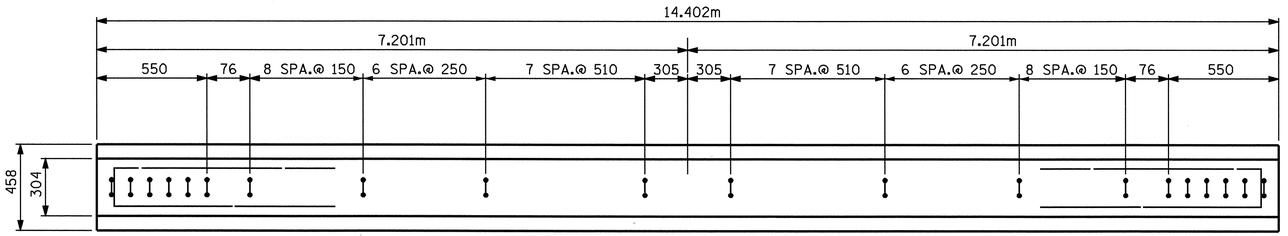
ALL PRESTRESSED STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 30.3 MPa.

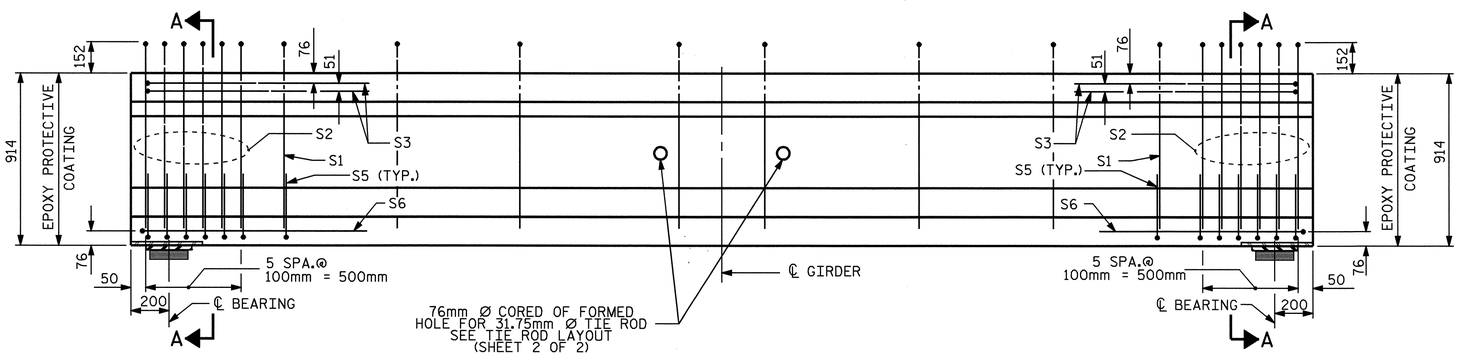
DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

THE TOP SURFACE OF THE GIRDER SHALL BE RAKED TO A DEPTH OF 6mm EXCEPT IN THE AREA BETWEEN THE STIRRUP AND THE EDGE OF THE GIRDER.

FOR VERTICAL CRACKS IN PRESTRESSED CONCRETE GIRDERS PRIOR TO DETENSIONING, SEE SPECIAL PROVISIONS.



PLAN OF GIRDER



ELEVATION OF GIRDER

12.7 Ø L.R GRADE 1860 STRANDS

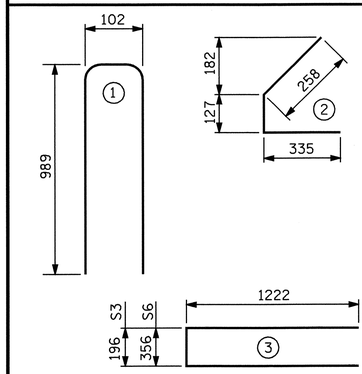
AREA (mm²)	ULTIMATE STRENGTH (kN PER STRAND)	APPLIED PRESTRESS (kN PER STRAND)
98.71	183.7	137.8

REINFORCING STEEL FOR ONE GDR.

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	44	#13	1	2080	91
S2	12	#16	1	2080	39
S3	4	#13	3	2640	10
S5	56	#13	2	720	40
S6	2	#13	3	2800	6

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	41.4 MPa CONCRETE	12.70mm Ø L.R. STRANDS
	kg	m³	No.
	186	3.428	20

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	14.402	72.010

PROJECT NO. R-2562AC

CUMBERLAND COUNTY

STATION: 25+36.132-LREV

SHEET 1 OF 2

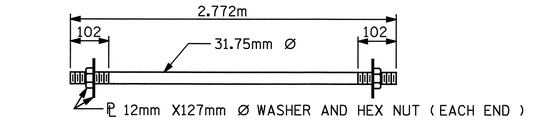
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

AASHTO TYPE II PRESTRESSED CONCRETE GIRDER (NBL)

ASSEMBLED BY : T.L. CLELLAND	DATE : 4/27/06
CHECKED BY : K.W. ALFORD	DATE : 5/31/06
DRAWN BY : EEM 2/97	REV. 8/16/99 RWW/LES
CHECKED BY : VP 2/97	

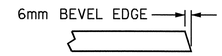
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			44

NCBDSM

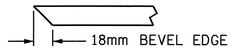


31.75mm Ø TIE ROD ASSEMBLY

(4 COMPLETE ASSEMBLIES REQUIRED)

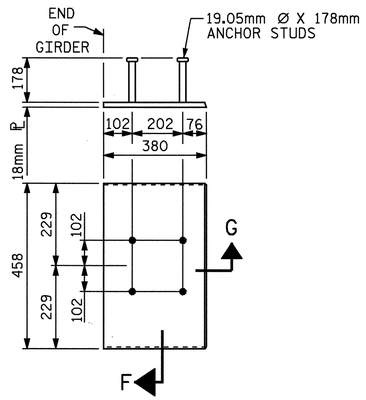


SECTION "G"



SECTION "F"

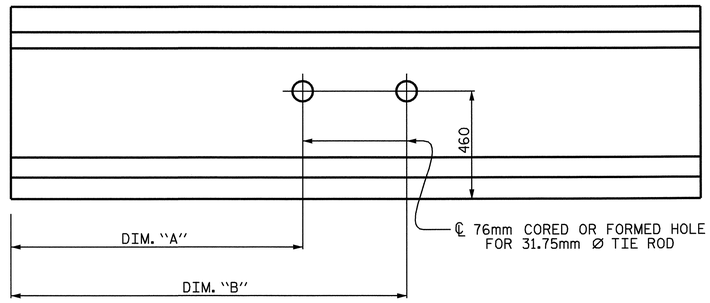
(SEE NOTES)



EMBEDDED PLATE "B-1" DETAILS

(2 REQ'D PER GIRDER)

SUPPLEMENTAL SPAN		
GIRDER	DIM. "A"	DIM. "B"
1	5.700m	
2	5.700m	8.220m
3	5.700m	8.220m
4	5.700m	8.220m
5		8.220m



GIRDER LAYOUT

NOTE: ONLY ONE HOLE IS REQUIRED ON EXTERIOR GIRDER.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

12.70mm Ø LOW RELAXATION	SUPPLEMENTAL SPAN																						
	GIRDERS 1 AND 5											GIRDERS 2 THRU 4											
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.008	0.016	0.022	0.025	0.027	0.025	0.022	0.016	0.008	0.000	0.000	0.008	0.016	0.022	0.025	0.027	0.025	0.022	0.016	0.008	0.000
✳ DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD ↓	0.000	0.004	0.007	0.010	0.012	0.013	0.012	0.010	0.007	0.004	0.000	0.000	0.004	0.008	0.011	0.013	0.014	0.013	0.011	0.008	0.004	0.000
FINAL CAMBER ↑	0	4	9	12	13	14	13	12	9	4	0	0	4	8	11	12	13	12	11	8	4	0

ALL VALUES ARE SHOWN IN METERS, EXCEPT " FINAL CAMBER ", WHICH IS GIVEN IN MILLIMETERS.
✳ INCLUDES FUTURE WEARING SURFACE

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS 10/24/06

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD 10/24/06

PROJECT NO. R-2562AC

CUMBERLAND COUNTY

STATION: 25+36.132-LREV-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD PRESTRESSED CONCRETE GIRDER DETAILS (NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			44

ASSEMBLED BY : T.L.CLELLAND	DATE : 4/21/06
CHECKED BY : K.W. ALFORD	DATE : 5/31/06
DRAWN BY : ELR 11/91	REV. 8/16/99 MAB/LES
CHECKED BY : GRP 11/91	REV. 10/17/00 RWW/LES
	REV. 7/10/01RR LES/RDR

24-OCT-2006 12:32
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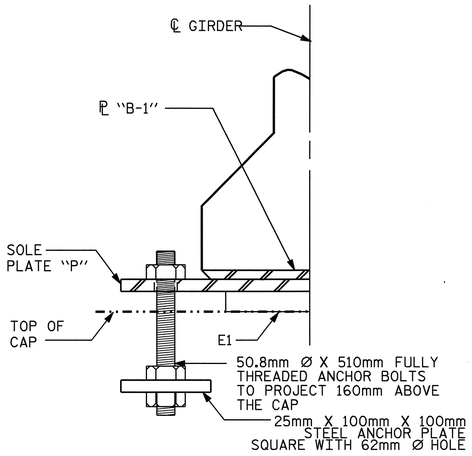
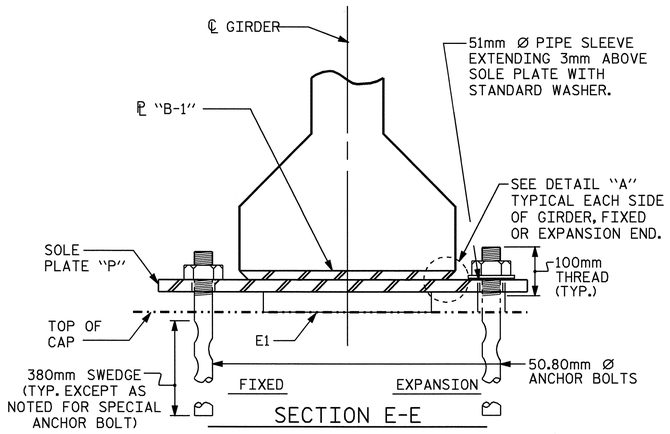
STD. NO. PCG11SM

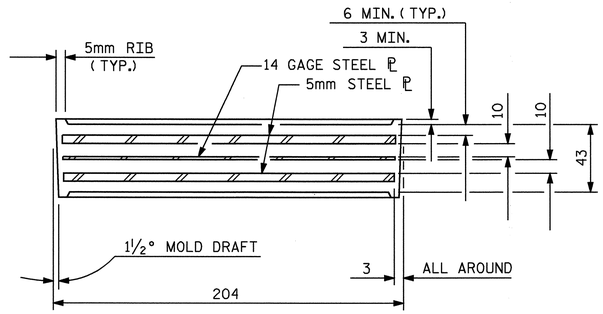


SPECIAL ANCHOR BOLT DETAIL

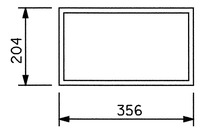
(HALF SECTION)



SECTION E-E



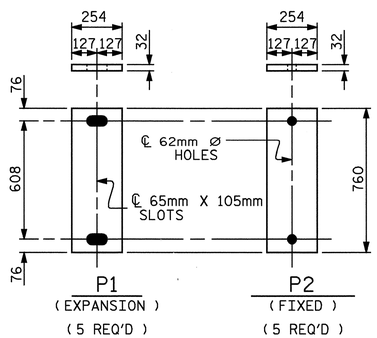
TYPICAL SECTION OF ELASTOMERIC BEARINGS



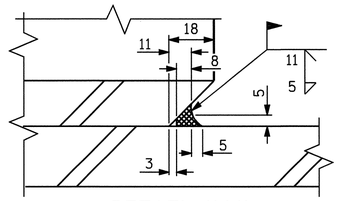
E1 (10 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE II

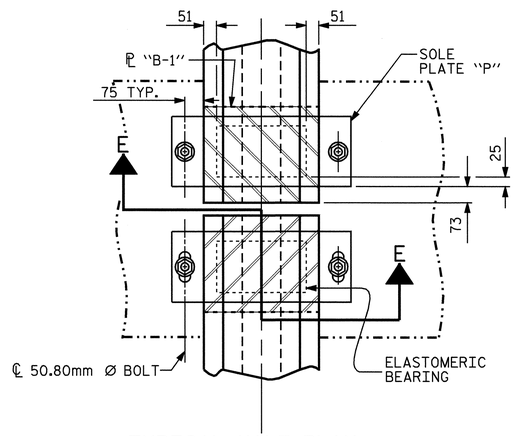


SOLE PLATE DETAILS ("P")



DETAIL "A"

— LOAD RATINGS —	
	MAX.D.L.+L.L.
914mm PCG -TYPE II	366 kN



TYPICAL HALF-PLAN

(SHOWING SIMPLE SPAN BENT)

NOTES

FOR ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF ½ TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

THE 51mm Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.

STEEL SOLE PLATES, ANCHOR BOLTS, NUTS, STEEL ANCHOR PLATE, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 149°C. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

SOLE PLATE "P", BOLTS, NUTS, WASHERS, STEEL ANCHOR PLATE, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291M-12 OR AASHTO M292M-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293M. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

ASSEMBLED BY : T.L.CLELLAND	DATE : 4/28/06
CHECKED BY : K.W. ALFORD	DATE : 5/31/06
DRAWN BY : WJH 8/89	REV. 8/16/99 RWW/LES
CHECKED BY : CRK 8/89	REV. 10/17/00 RWW/LES
	REV. 7/10/01 RWW/LES

29-NOV-2006 12:08
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tclelland

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD
11/29/06

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS
11/29/06

PROJECT NO. R-2562AC

CUMBERLAND COUNTY

STATION: 25+36.132-LREV-

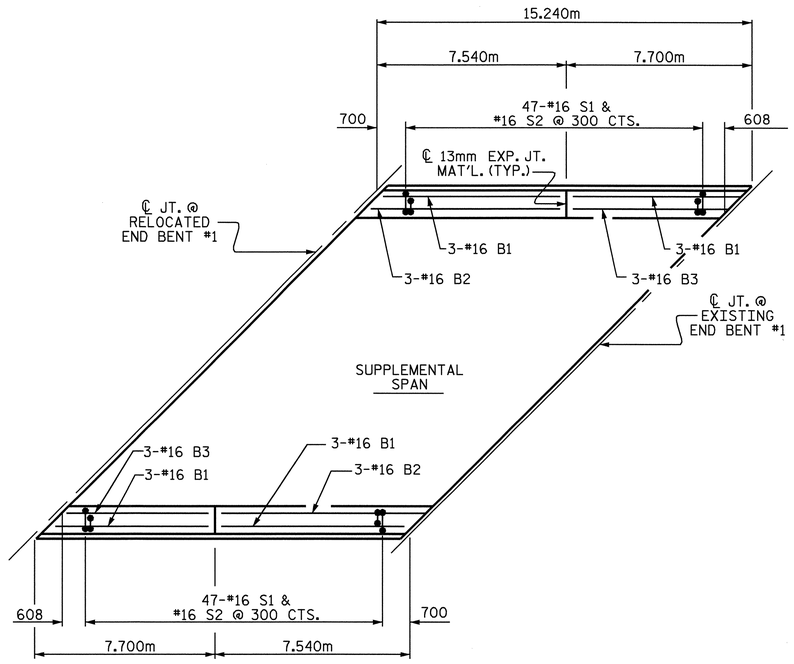
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE (NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			44

STD. NO. EB3SM



PLAN

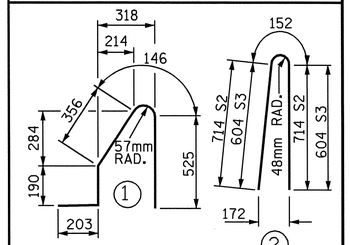
NOTES

THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 20.7 MPa.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE BARRIER RAIL ON EXISTING SPAN "A" AT THE EXISTING GUARDRAIL ATTACHMENT SHALL BE BUILT UP TO MATCH THE BARRIER RAIL ON THE SUPPLEMENTAL SPAN AS DIRECTED BY ENGINEER. THIS SHALL BE INCIDENTAL TO THE COST OF THE BARRIER RAIL.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

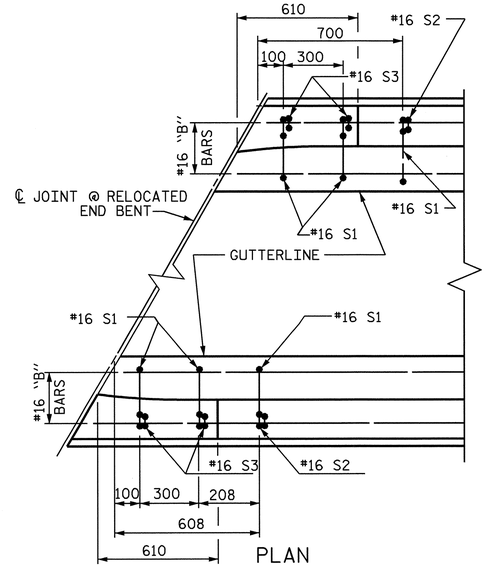
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ S1	102	#16	1	1420	225
✱ S2	94	#16	2	1580	231
✱ S3	8	#16	2	1360	17
✱ B1	12	#16	STR	7420	138
✱ B2	6	#16	STR	7680	72
✱ B3	6	#16	STR	7160	67

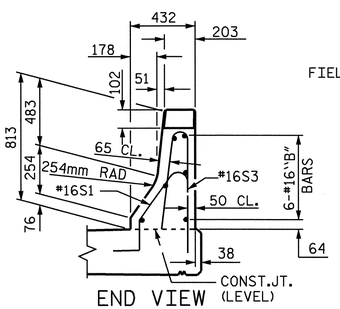
✱ EPOXY COATED REINFORCING STEEL 750kg

CLASS AA CONCRETE 7.0 CU. METER

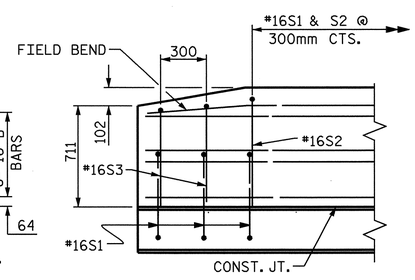
CONCRETE BARRIER RAIL 30.5 METERS



PLAN

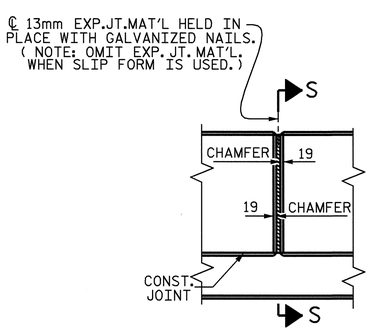


END VIEW

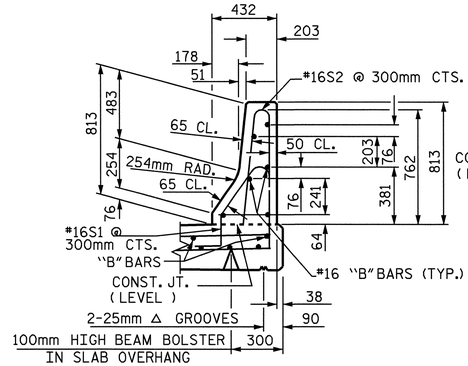


SIDE VIEW

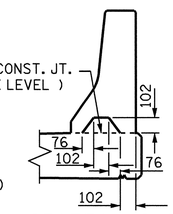
BARRIER RAIL - END OF RAIL DETAILS



ELEVATION AT EXPANSION JOINTS



SECTION THRU RAIL



SECTION S-S

AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY
WHEN SLIP FORM IS USED)

PROJECT NO. R-2562AC

CUMBERLAND COUNTY

STATION: 25+36.132-LREV-

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KEVIN W. ALFORD

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS 11/21/06

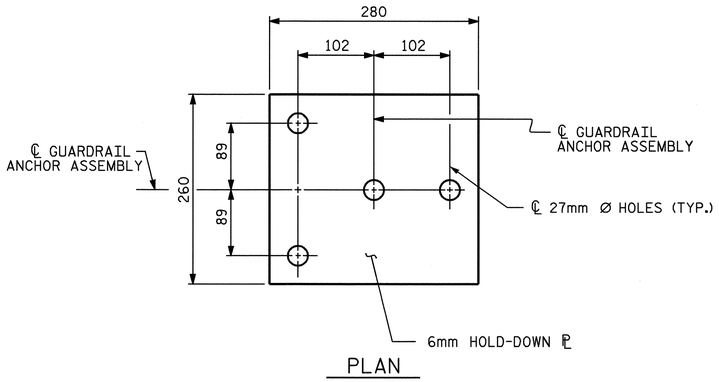
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD CONCRETE BARRIER RAIL (NBL)

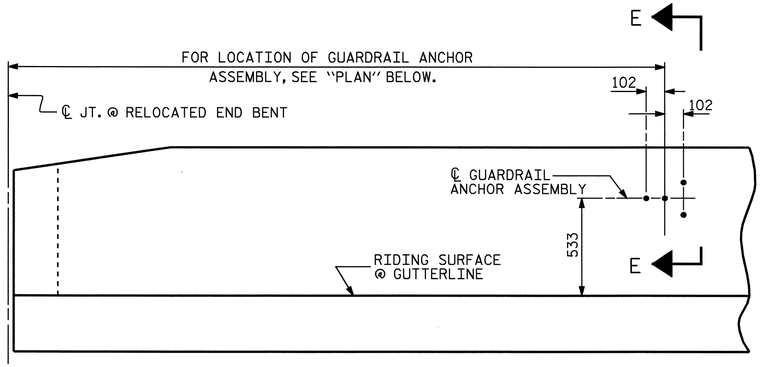
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			44

ASSEMBLED BY : T.L. CLELLAND	DATE : 4/20/06		
CHECKED BY : K.W. ALFORD	DATE : 5/31/06		
DRAWN BY : ARB 5/87	REV. 5/16/97 EEM/RGW		
CHECKED BY : SJD 9/87			

CBRISM



PLAN



ELEVATION

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 6mm HOLD DOWN PLATE AND 4 - 22.23mm Ø BOLTS WITH NUTS AND WASHERS.

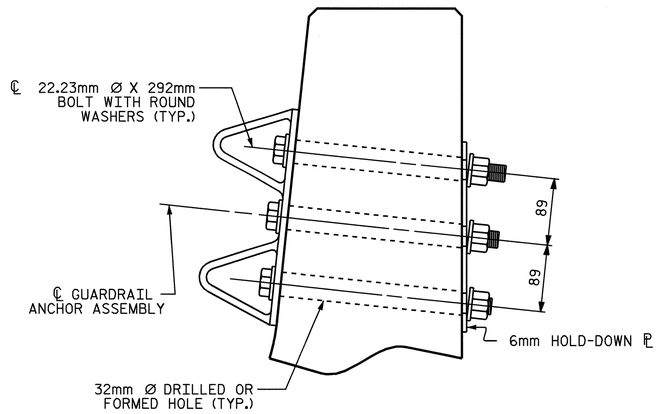
THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 250. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A563. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 22.23mm Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

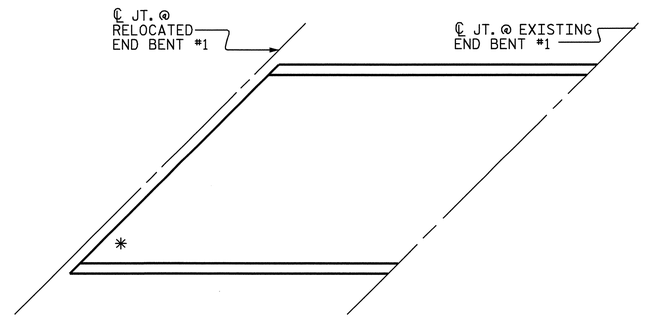
AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.



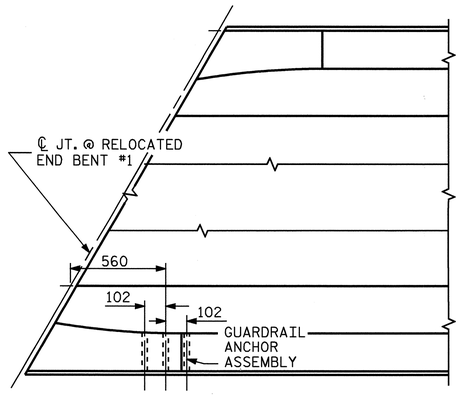
SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

PROJECT NO. R-2562AC
CUMBERLAND COUNTY
STATION: 25+36.132-LREV-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL (NBL)

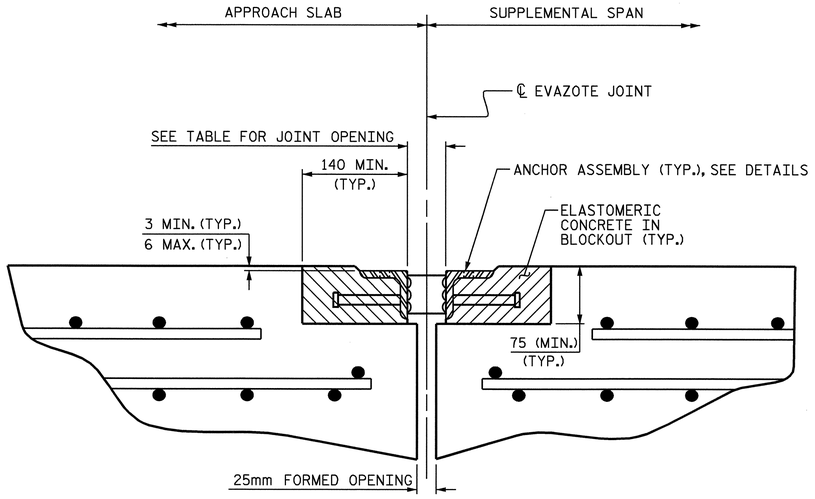
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			44

ASSEMBLED BY : T.L. CLELLAND DATE : 4/20/06
CHECKED BY : K.W. ALFORD DATE : 5/31/06
DRAWN BY : JMB 12/87
CHECKED BY : ARB 12/87
REV. 5/16/97R EEM/RGW

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD
10/24/06

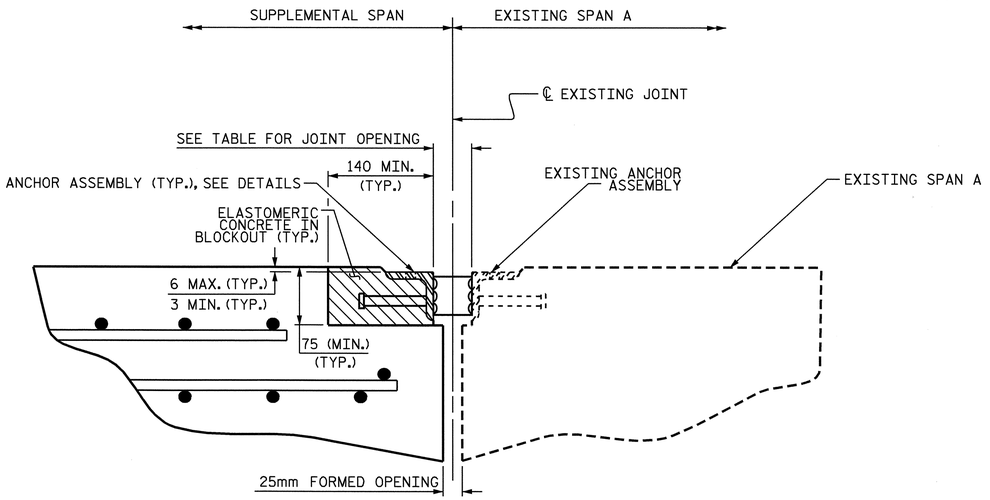
NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM R. DAVIS
10/24/06

STD. NO. GRA1SM



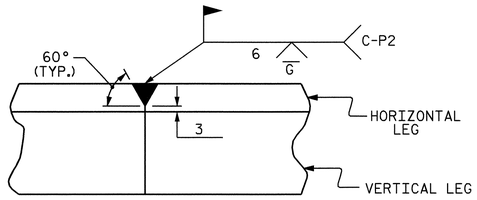
ARMORED JOINT DETAILS

SECTION NORMAL TO JOINT AT RELOCATED END BENT



ARMORED JOINT DETAILS

SECTION NORMAL TO JOINT AT EXISTING END BENT



DETAIL- FIELD WELD SPLICE OF ANGLE

NOTES

ANGLES SHALL CONFORM TO AASHTO M270 GRADE 250 STEEL OR APPROVED EQUAL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169 GRADES 1010 THRU 1020 OR APPROVED EQUAL.

STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON THE PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.

UPON COMPLETION OF SHOP FABRICATION, THE ENTIRE ANCHOR ASSEMBLY SHALL BE METALLIZED. THE 12.70mm Ø STUD ANCHORS AND ANCHOR TABS NEED NOT BE METALLIZED. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

ANCHOR ASSEMBLY SHALL BE MADE CONTINUOUS THE LENGTH OF THE JOINT FROM GUTTER TO GUTTER. FOR FIELD SPLICES AT ALL CROWN BREAK POINTS, THE ENDS OF THE STEEL ANGLES SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE. FINISHED FIELD WELDS SHALL BE GROUND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 0.100mm OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ANCHOR ASSEMBLY SEGMENTS SHALL NOT BE LESS 3.6m NOR MORE THAN 6.1m IN LENGTH. SHORTER SEGMENTS MAY BE USED AT THE EDGE OF ROADWAY OR AT POINTS OF STAGED CONSTRUCTION.

THE ANCHOR ASSEMBLY SHALL BE SECURED AND LEVELED AS SHOWN IN THE "ARMORED JOINT ANCHOR ASSEMBLY DETAILS". NO SUBMITTALS ARE REQUIRED FOR 9.53mm Ø EXPANSION ANCHORS, NUTS OR WASHERS. THE CONTRACTOR MAY SUBMIT FOR APPROVAL AN ALTERNATE METHOD OF ALIGNING AND LEVELING THE ANGLES. THE ALTERNATE METHOD SHALL NOT INCLUDE ANY WELDING TO THE OUTSIDE FACE OF THE ANGLES.

AFTER THE ELASTOMERIC CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE ANY EXCESS CONCRETE THAT COMES THROUGH THE WEEP HOLES AND THOROUGHLY CLEAN THE ANGLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM OF 0.100mm OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

SEE SPECIAL PROVISIONS FOR EVAZOTE JOINT SEALS.

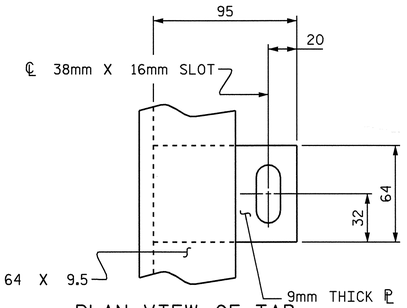
SEE SPECIAL PROVISIONS FOR ELASTOMERIC CONCRETE.

SEE SPECIAL PROVISIONS FOR EXISTING EVAZOTE JOINT SEAL @ END BENT #1.

MOVEMENT AND SETTING AT EVAZOTE JOINT

BENT TYPE	SKEW ANGLE	NOMINAL UNCOMPRESSED SEAL WIDTH	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 0° C	PERPENDICULAR JOINT OPENING AT 16° C	PERPENDICULAR JOINT OPENING AT 32° C
RELOCATED END BENT	135°-00'-00"	64mm	7mm	53mm	51mm	47mm
EXISTING END BENT	135°-00'-00"	71mm	26mm	53mm	43mm	33mm

TOTAL MOVEMENT IS CALCULATED ALONG THE CENTERLINE OF ROADWAY.
JOINT OPENINGS ARE MEASURED PERPENDICULAR TO THE JOINT.

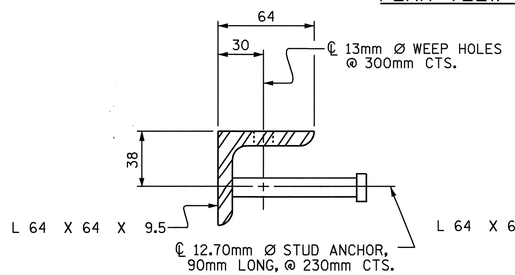


PLAN VIEW OF TAB

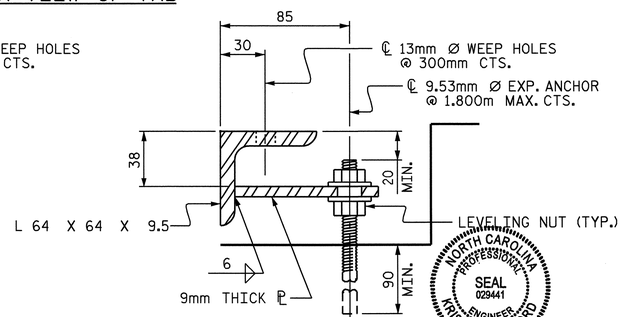
BILL OF MATERIAL

BENT TYPE	ELASTOMERIC CONCRETE * (CU. m)	TOTAL LENGTH OF ANGLE (m)
RELOCATED END BENT	0.34	32.2
EXISTING END BENT	0.17	16.1

* BASED ON THE MINIMUM BLOCKOUT SHOWN.



SECTION VIEW OF STUD



SECTION VIEW OF TAB

ARMORED JOINT ANCHOR ASSEMBLY DETAILS

PROJECT NO. R-2562AC
CUMBERLAND COUNTY
STATION: 25+36.132-LREV-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD ARMORED EVAZOTE JOINT DETAILS (NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			44

ASSEMBLED BY : T.L. CLELLAND DATE : 5/15/06
CHECKED BY : K.W. ALFORD DATE : 5/31/06

DRAWN BY : EEM 1/96
CHECKED BY : RGW 1/96

REV. 10/17/00 RWW/LES
REV. 7/10/01 LES/RDR
REV. 5/7/03RR RWW/JTE

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tclelland

STD. NO. AEJ1SM

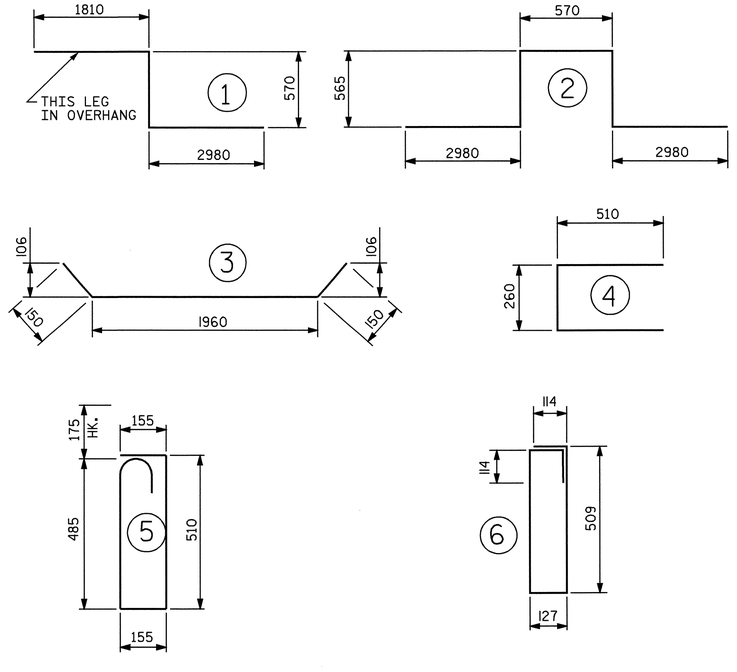
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS					
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#13	610	540	610	540	840
#16	770	660	770	660	1050
#19	920	790	1190	790	1330
#22	1580	1060			
#25	2080	1390			

REINFORCING BAR SCHEDULE

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	17	#16	STR	12240	323	A137	6	#16	STR	4640	43
A2	17	#16	STR	12240	323	A138	6	#16	STR	4120	38
						A139	6	#16	STR	3620	34
✳ A101	6	#16	STR	11780	110	A140	6	#16	STR	3100	29
✳ A102	6	#16	STR	11260	105	A141	6	#16	STR	2600	24
✳ A103	6	#16	STR	10760	100	A142	6	#16	STR	2080	19
✳ A104	6	#16	STR	10240	95	A143	6	#16	STR	1580	15
✳ A105	6	#16	STR	9740	91	A144	6	#16	STR	1060	10
✳ A106	6	#16	STR	9220	86						
✳ A107	6	#16	STR	8720	81	✳ B1	54	#13	STR	7680	412
✳ A108	6	#16	STR	8200	76	B2	44	#16	STR	15040	1027
✳ A109	6	#16	STR	7700	72						
✳ A110	6	#16	STR	7180	67	✳ G1	2	#16	STR	17300	54
✳ A111	6	#16	STR	6680	62						
✳ A112	6	#16	STR	6160	57	✳ K1	24	#19	STR	2980	160
✳ A113	6	#16	STR	5860	55	✳ K2	8	#25	1	5360	170
✳ A114	6	#16	STR	5140	48	✳ K3	12	#25	2	7660	365
✳ A115	6	#16	STR	4640	43	K4	8	#16	3	2260	28
✳ A116	6	#16	STR	4120	38	K5	8	#16	STR	2120	26
✳ A117	6	#16	STR	3620	34						
✳ A118	6	#16	STR	3100	29	✳ S1	64	#13	4	1280	81
✳ A119	6	#16	STR	2600	24	✳ S2	64	#16	5	1480	147
✳ A120	6	#16	STR	2080	19	S3	28	#13	6	1500	42
✳ A121	6	#16	STR	1580	15						
✳ A122	6	#16	STR	1060	10						
A123	6	#16	STR	11780	110						
A124	6	#16	STR	11260	105						
A125	6	#16	STR	10760	100						
A126	6	#16	STR	10240	95						
A127	6	#16	STR	8740	81						
A128	6	#16	STR	9220	86						
A129	6	#16	STR	8720	81						
A130	6	#16	STR	8200	76						
A131	6	#16	STR	7700	72						
A132	6	#16	STR	7180	67						
A133	6	#16	STR	6680	62						
A134	6	#16	STR	6160	57						
A135	6	#16	STR	5660	53						
A136	6	#16	STR	5140	48						
REINFORCING STEEL = 2763 KG											
✳ EPOXY COATED REINF. STEEL = 3029 KG											

BAR TYPES



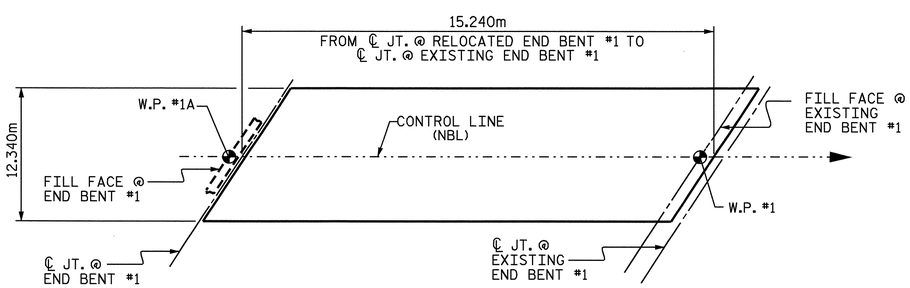
ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. METER)	(kg)	(kg)
SUPPLEMENTAL SPAN	55.3	2763	3029
TOTALS ✳✳	55.3	2763	3029

✳✳ QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

GROOVING BRIDGE FLOORS		
BRIDGE DECK	153.7	SQ. METER
APPROACH SLAB	51.5	SQ. METER
TOTAL	205.2	SQ. METER



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB
(SQ. METER = 188.1)

PROJECT NO. R-2562AC
CUMBERLAND COUNTY
STATION: 25+36.132-LREV-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL (NBL)

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD 11/3/06

NORTH CAROLINA PROFESSIONAL SEAL 1 1905 ENGINEER WILLIAM A. DAVIS 11/3/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			44

DRAWN BY : T.L. CLELLAND DATE : 4/21/06
CHECKED BY : K.W. ALFORD DATE : 5/31/06

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

FOR PILE SPLICE DETAIL, SEE SHEET 3 OF 3

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

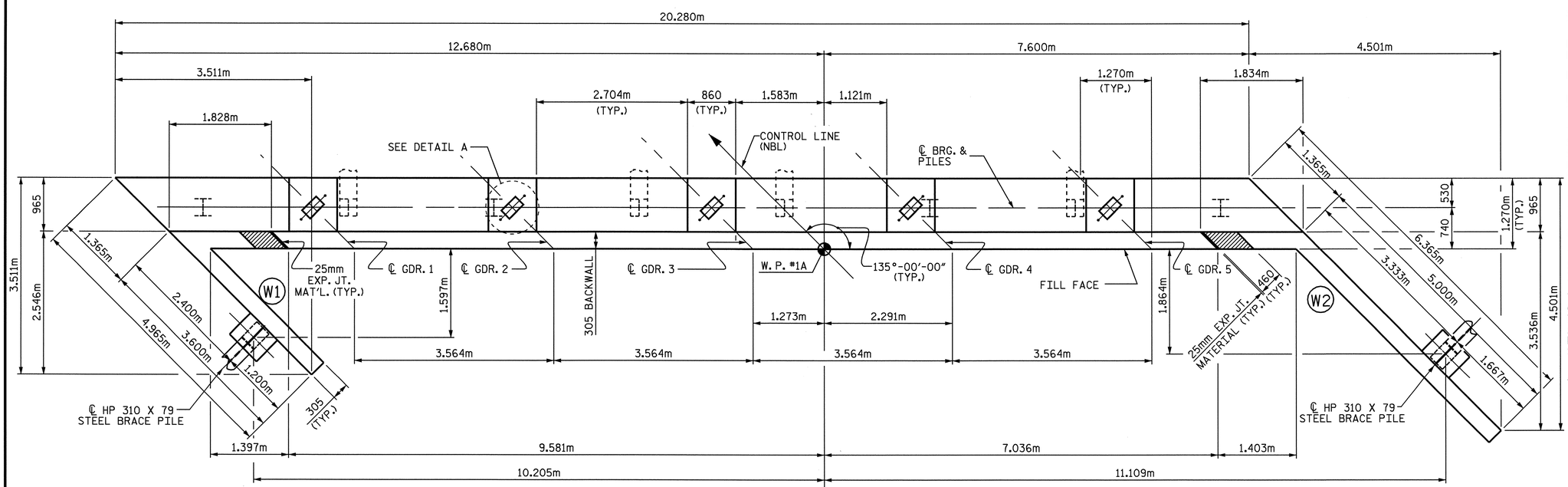
THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2 %.

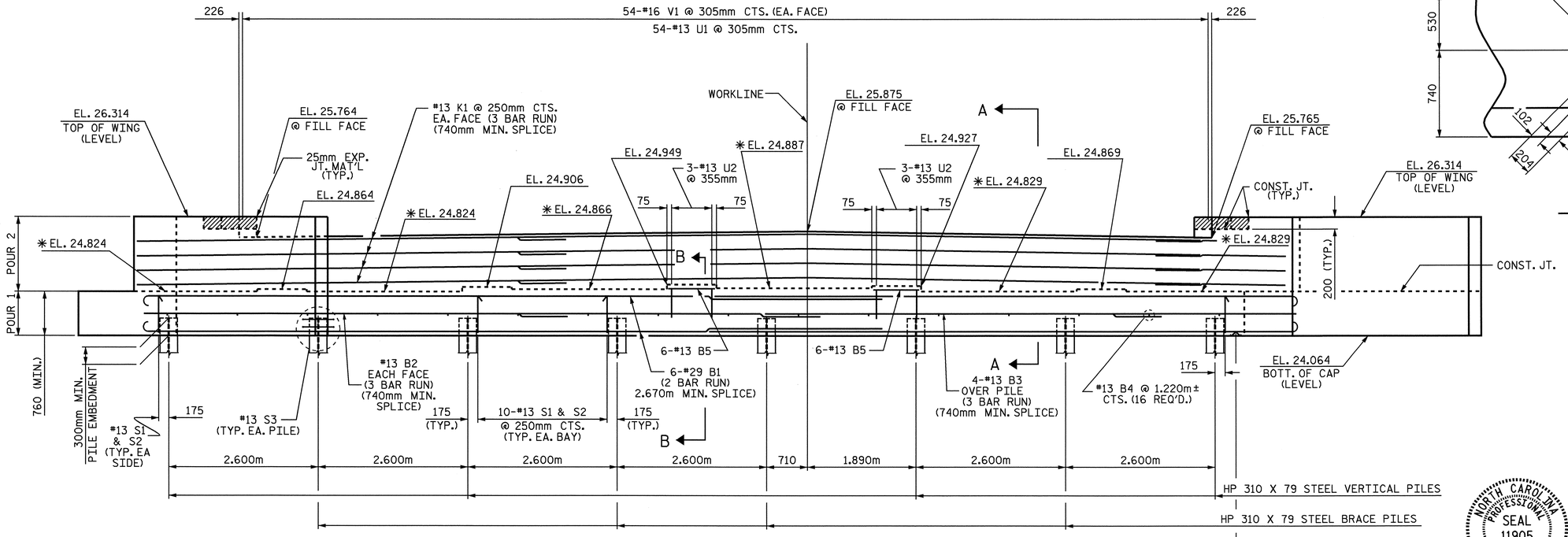
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 102mm Ø DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

✳FOR LOCATION OF ELEVATION SEE SHEET 3 OF 3.

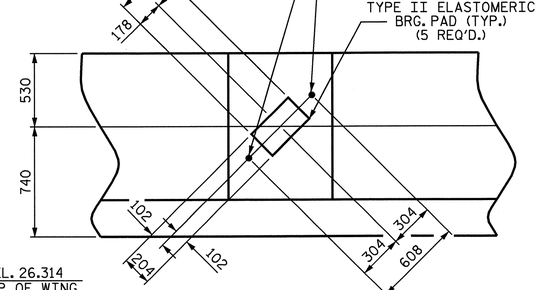


PLAN



ELEVATION

(WING BRACE PILES NOT SHOWN IN ELEVATION FOR CLARITY)



DETAIL A

PROJECT NO. R-2562AC

CUMBERLAND COUNTY

STATION: 25+36.132-LREV-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE RELOCATED END BENT #1 (NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS
14/5/06

DRAWN BY : T.L. CLELLAND DATE : 5/5/06
CHECKED BY : N.M. RUFFIN DATE : 6/5/06

02-NOV-2006 15:31
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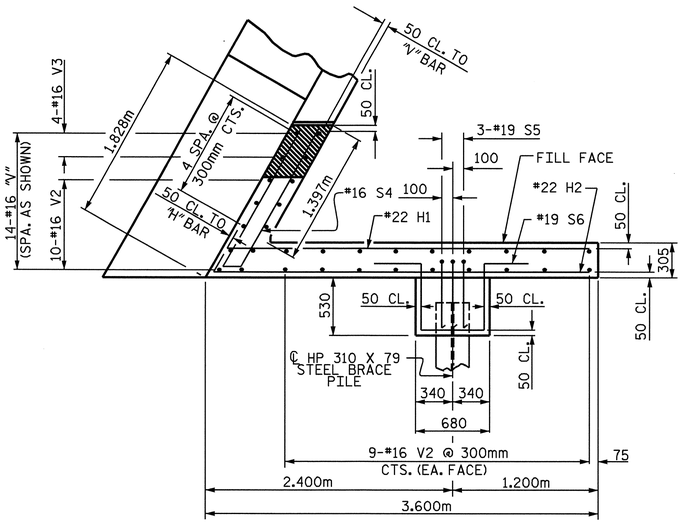
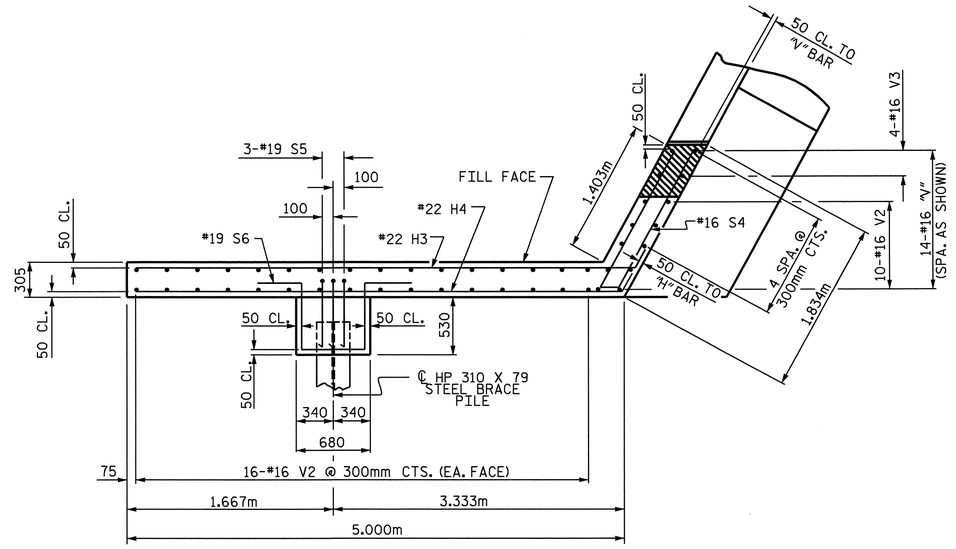
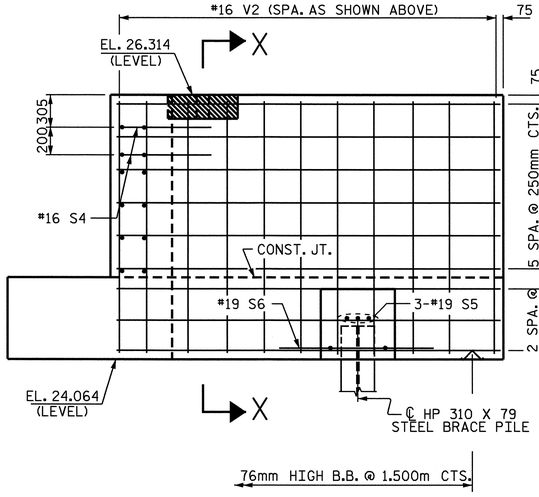


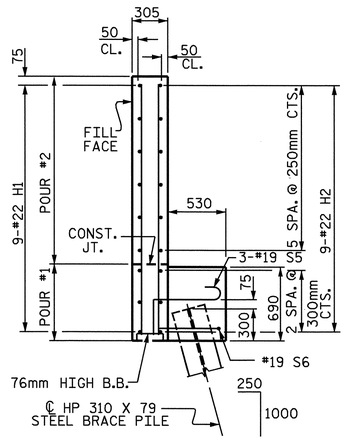
PLAN OF LEFT WING-W1



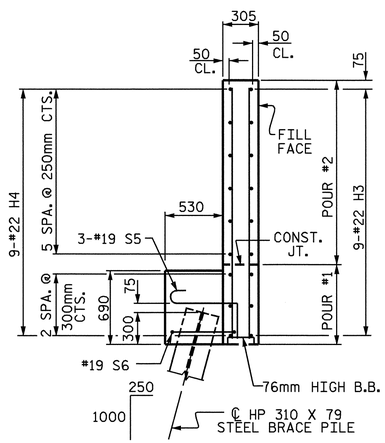
PLAN OF RIGHT WING-W2



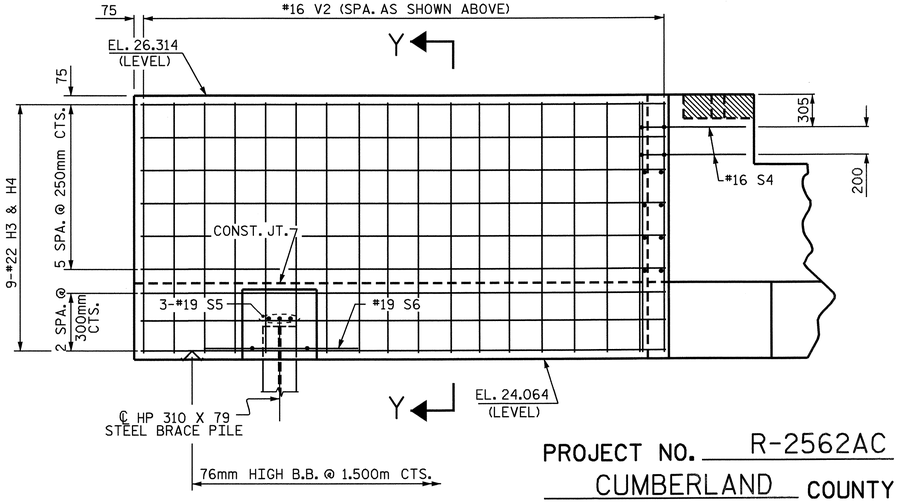
ELEVATION OF LEFT WING-W1



SECTION X-X



SECTION Y-Y



ELEVATION OF RIGHT WING-W2

PROJECT NO. R-2562AC

CUMBERLAND COUNTY

STATION: 25+36.132-LREV-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE RELOCATED END BENT #1 (NBL)

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS
10/24/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37
1			3			TOTAL SHEETS
2			4			44

DRAWN BY : T.L. CLELLAND DATE : 5/5/06
CHECKED BY : N.M. RUFFIN DATE : 6/5/06

24-OCT-2006 12:29
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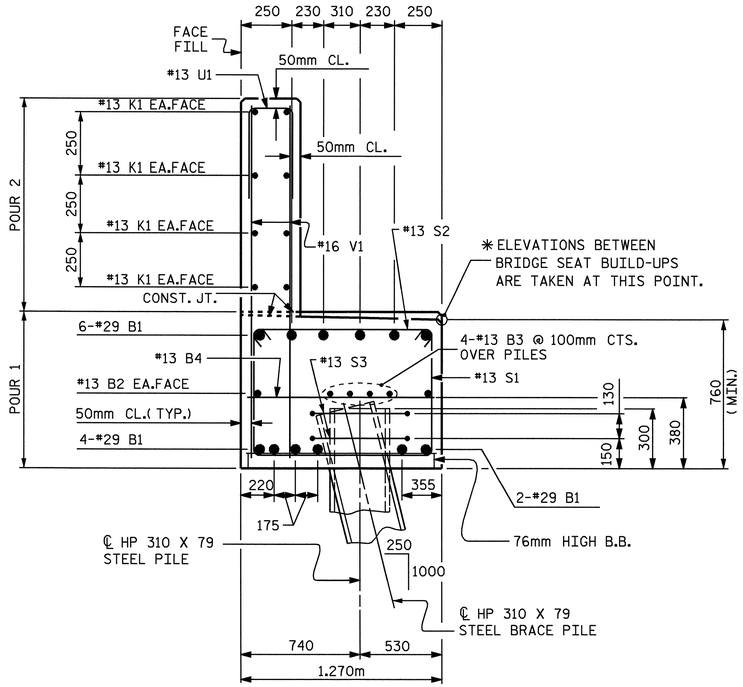
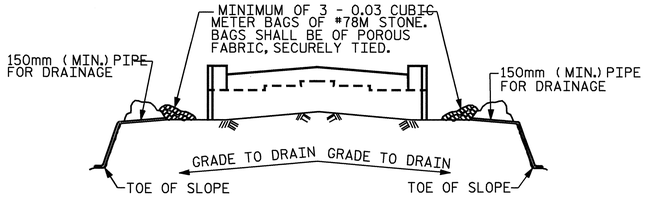


SECTION A-A

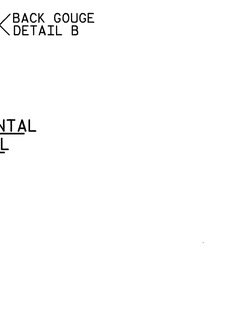


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE,CORRUGATED STEEL,CORRUGATED ALUMINUM ALLOY,OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

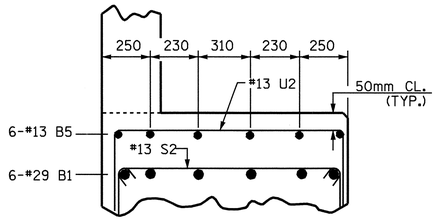
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



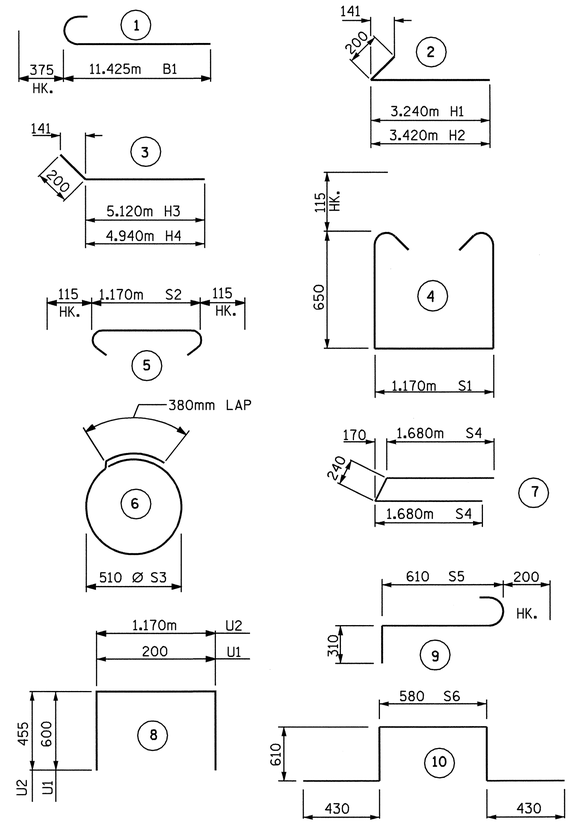
** POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



SECTION B-B

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

END BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	24	29	1	11800	1433
B2	6	13	STR	7220	43
B3	12	13	STR	7220	86
B4	16	13	STR	1160	18
B5	12	13	STR	760	9
H1	9	22	2	3440	94
H2	9	22	2	3620	99
H3	9	22	3	5320	146
H4	9	22	3	5140	141
K1	24	13	STR	7220	172
S1	72	13	4	2700	193
S2	72	13	5	1400	100
S3	16	13	6	1980	31
S4	4	16	7	3600	22
S5	6	19	9	1120	15
S6	2	19	10	2660	12
U1	54	13	8	1400	75
U2	6	13	8	2080	12
V1	108	16	STR	1600	268
V2	70	16	STR	2120	230
V3	8	16	STR	1920	24

REINFORCING STEEL kg 3223

CLASS "A" CONCRETE

POUR #1 CAP & LOWER WING 21.3m³
POUR #2 BACKWALL & UPPER WING 10.1m³
CLASS "A" CONC. TOTAL 31.4 m³

HP 310 X 79 STEEL PILES
NO. 10 LIN. METERS 100.0

PROJECT NO. R-2562AC
CUMBERLAND COUNTY
STATION: 25+36.132-LREV-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE RELOCATED END BENT #1 (NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS
10/24/2006

DRAWN BY : T.L. CLELLAND DATE : 5/5/06
CHECKED BY : N.M. RUFFIN DATE : 6/6/06

24-OCT-2006 12:29
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NOTES

THE CROSS-HATCHED AREA ON THE EXISTING END BENT SHALL BE REMOVED AS NOTED ON THE PLANS.

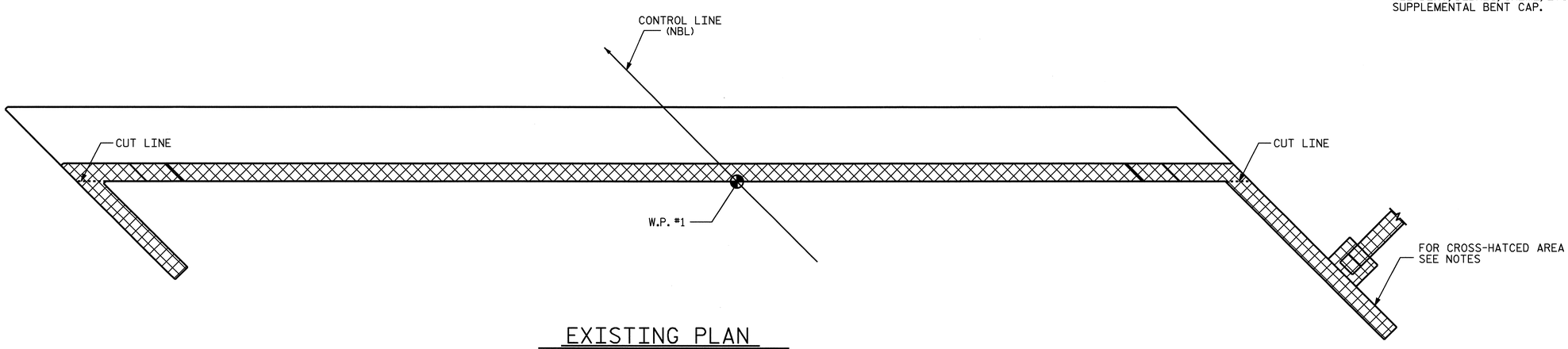
THE EXISTING WINGS AND WING FOOTINGS SHALL BE REMOVED FROM THE EXISTING END BENT CAPS.

THE EXISTING WING BRACE PILE SHALL BE REMOVED BELOW THE GROUND LINE AS DIRECTED BY THE ENGINEER.

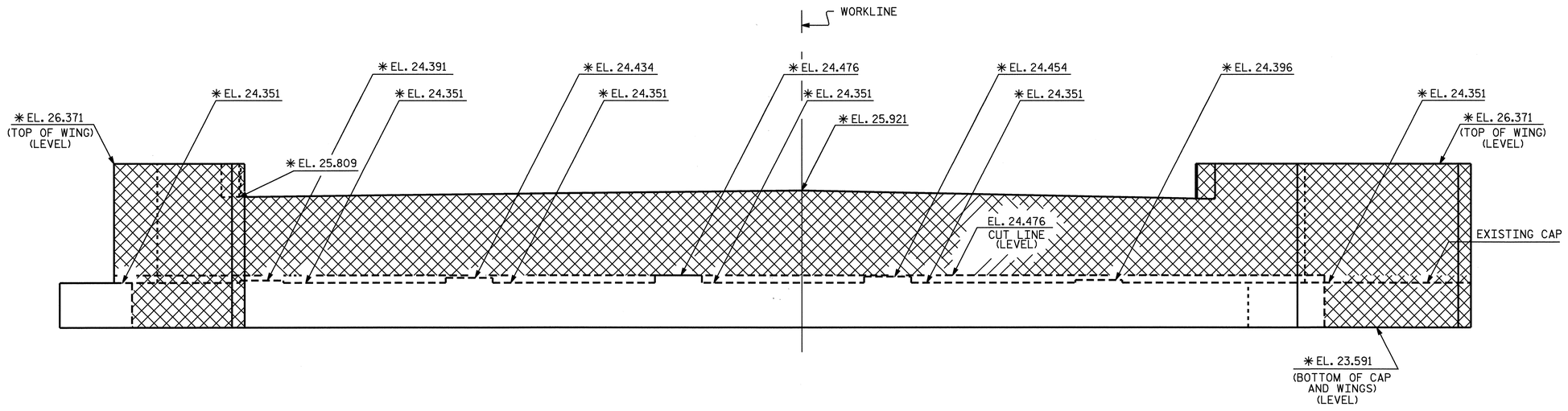
THE EXISTING BACKWALL SHALL BE CUT ALONG INDICATED CUT LINES AND REMOVED AS DIRECTED BY THE ENGINEER.

*ELEVATIONS SHOWN ARE OF THE EXISTING END BENT *1.

CLEAN EXISTING END BENT *1 FILL FACE TO REMOVE ALL DIRT, DEBRIS, GRIME, ETC. BEFORE FORMING SUPPLEMENTAL BENT CAP.



EXISTING PLAN



ELEVATION

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS
11/28/06

PROJECT NO. R-2562AC
CUMBERLAND COUNTY
STATION: 25+36.132 -LREV-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
EXISTING END BENT #1
(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			44

DRAWN BY : T.L. CLELLAND DATE : 6/9/06
CHECKED BY : N.M. RUFFIN DATE : 6/23/06

29-NOV-2006 12:08
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S:\PG4\squadh\R-2562AC\TCLELL01\R-5486201.DGN
tclelland

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

FOR PIPE INSERT DETAILS, SEE BEARINGS SHEET.

THE D1 AND D2 DOWELS SHALL BE LOCATED FROM THE EXISTING CAP FILL FACE, AND MAY BE SHIFTED AS NECESSARY TO MISS EXISTING CAP STEEL.

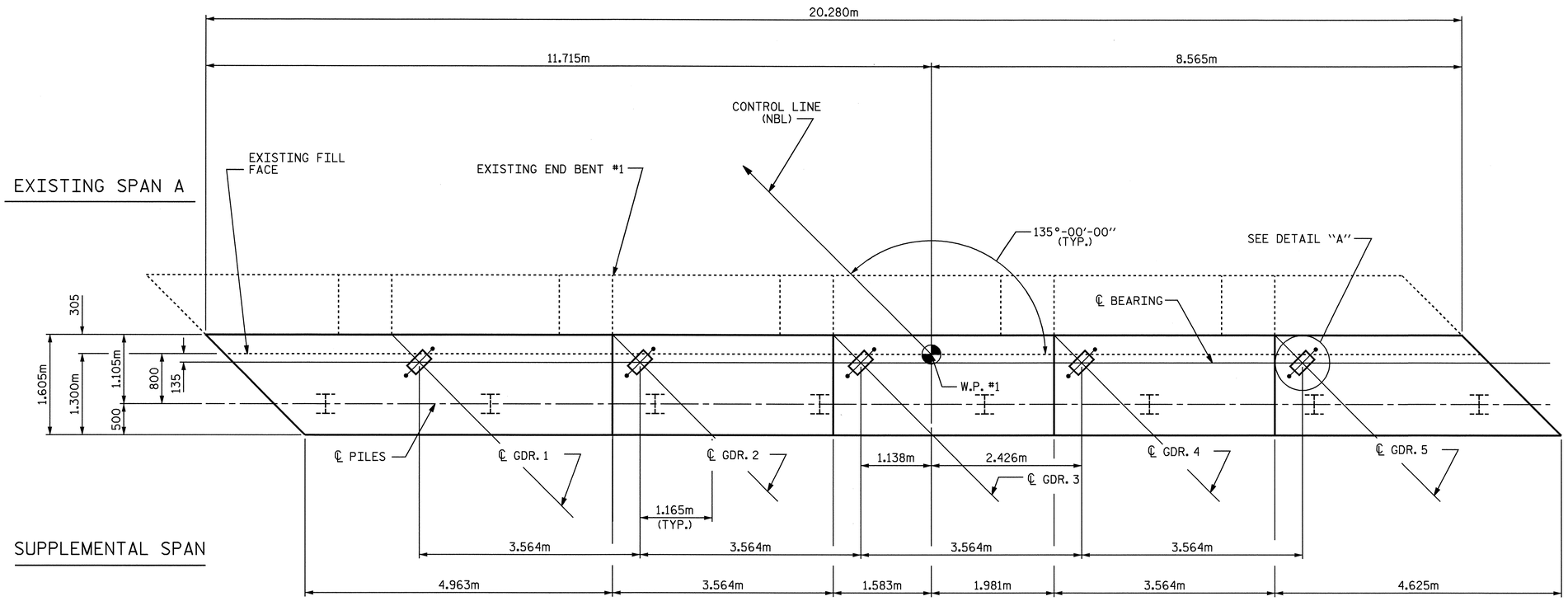
THE D1 AND D2 DOWELS SHALL BE ADHESIVELY ANCHORED.

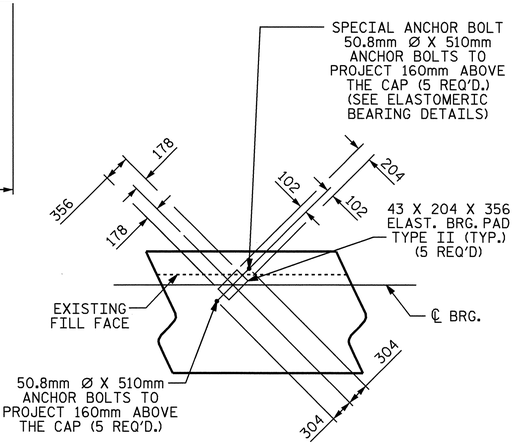
FOR THE ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS.

FOR GALVANIZING STEEL PILES, SEE SPECIAL PROVISIONS.

THE EXISTING PILES SHALL BE CLEANED AND PAINTED. SEE SPECIAL PROVISION FOR "CLEANING AND PAINTING EXISTING STEEL PILES."

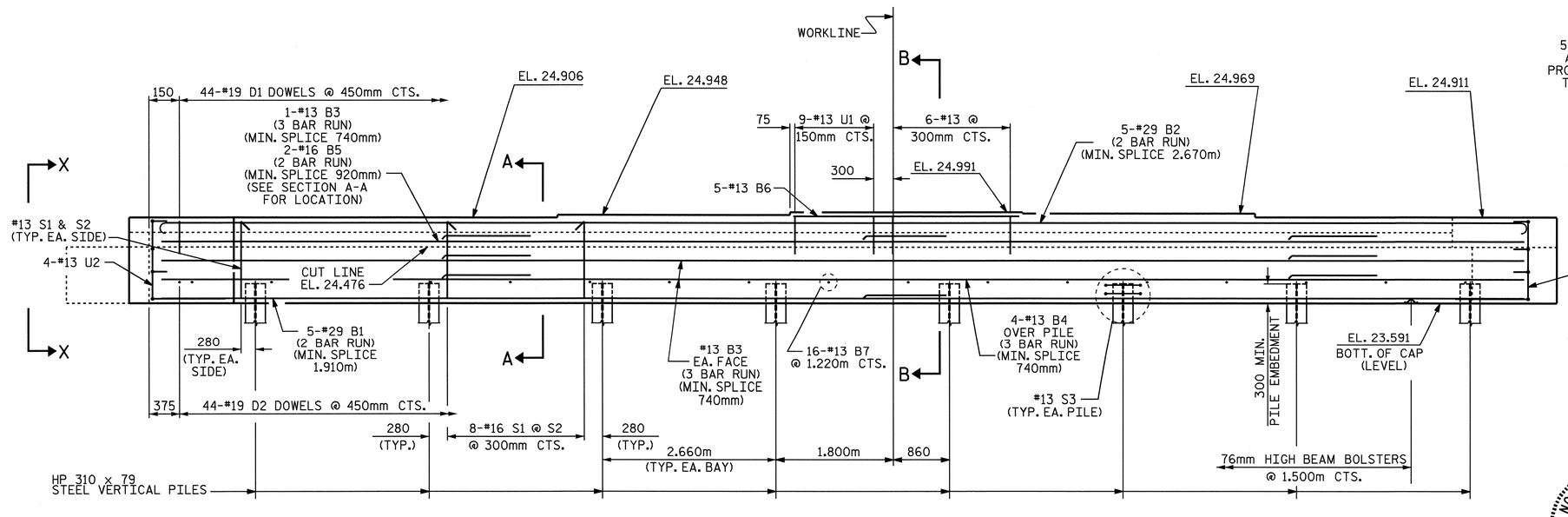
THE SUPPLEMENTAL PILES SHALL BE GALVANIZED. SEE SPECIAL PROVISION FOR "GALVANIZING STEEL PILES."





DETAIL "A"

PLAN



ELEVATION

PROJECT NO. R-2562AC
CUMBERLAND COUNTY
STATION: 25+36.132 -LREV-

SHEET 1 OF 2

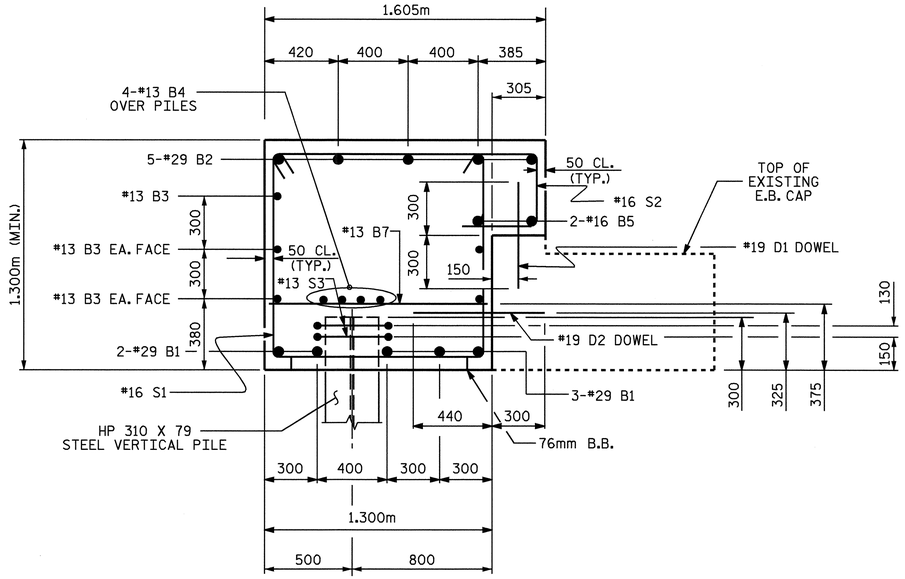
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
SUPPLEMENTAL BENT @ EXISTING END BENT #1
(NBL)

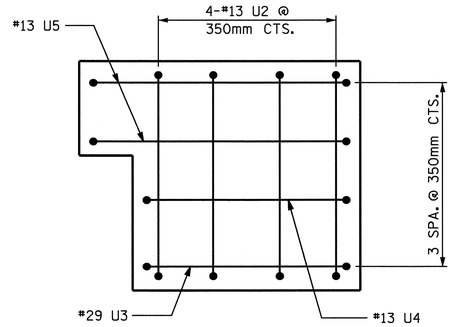
NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS
11/29/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			44

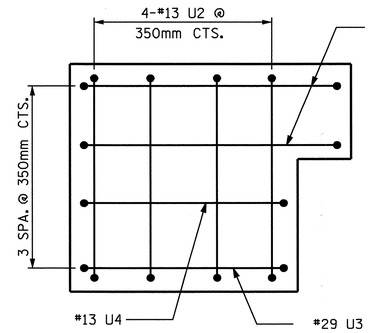
DRAWN BY : T.L. CLELLAND DATE : 6/19/06
CHECKED BY : N.M. RUFFIN DATE : 6/23/06



SECTION A-A



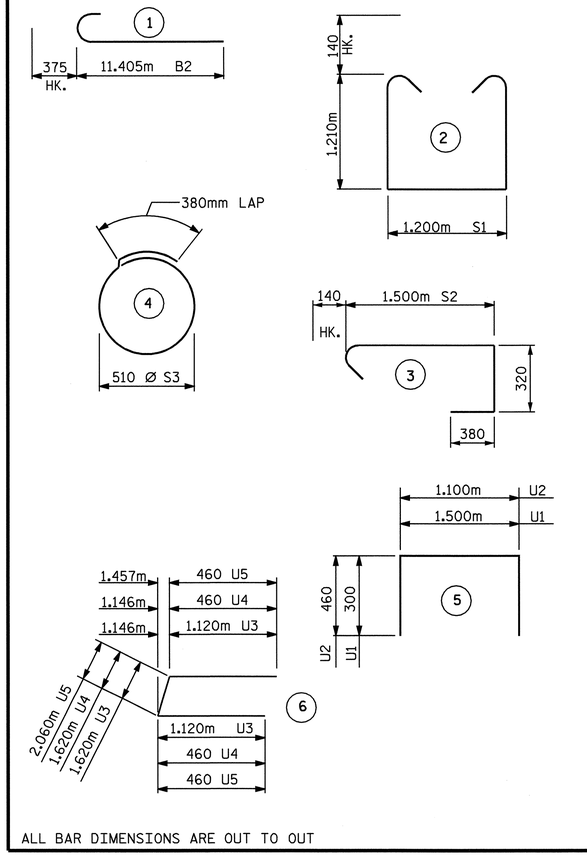
SECTION X-X



SECTION Y-Y

SECTION B-B

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

SUPPLEMENTAL BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#29	STR	11060	560
B2	10	#29	1	11780	596
B3	15	#13	STR	7220	108
B4	12	#13	STR	7220	86
B5	4	#16	STR	10560	66
B6	5	#13	STR	3460	17
B6	16	#13	STR	1000	16
D1	44	#19	STR	600	59
D2	44	#19	STR	740	73
S1	58	#16	2	3900	351
S2	58	#16	3	2340	211
S3	16	#13	4	1980	31
U1	15	#13	5	2100	31
U2	8	#13	5	2020	16
U3	2	#29	6	3860	39
U4	2	#13	6	2540	5
U5	4	#13	6	2980	12

REINFORCING STEEL = 2276 KG

CLASS "A" CONCRETE

POUR #1 CAP 38.6m³

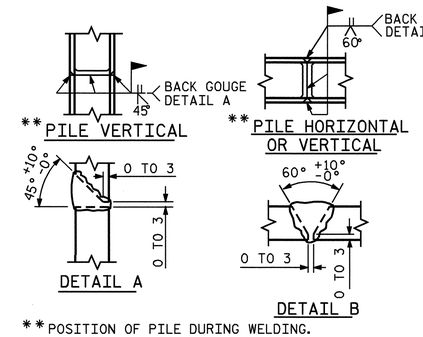
CLASS "A" CONC. TOTAL 38.6m³

HP 310 X 79 STEEL PILES

NO. 8 LIN. METERS 80.0

GALVANIZING STEEL PILES

LUMP SUM



PILE SPLICE DETAILS

PROJECT NO. R-2562AC

CUMBERLAND COUNTY

STATION: 25+36.132-LREV-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
SUPPLEMENTAL BENT @ EXISTING END BENT #1
(NBL)

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS
11/24/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			44

DRAWN BY : T.L. CLELLAND DATE : 5/5/06
CHECKED BY : N.M. RUFFIN DATE : 6/23/06

29-NOV-2006 12:09
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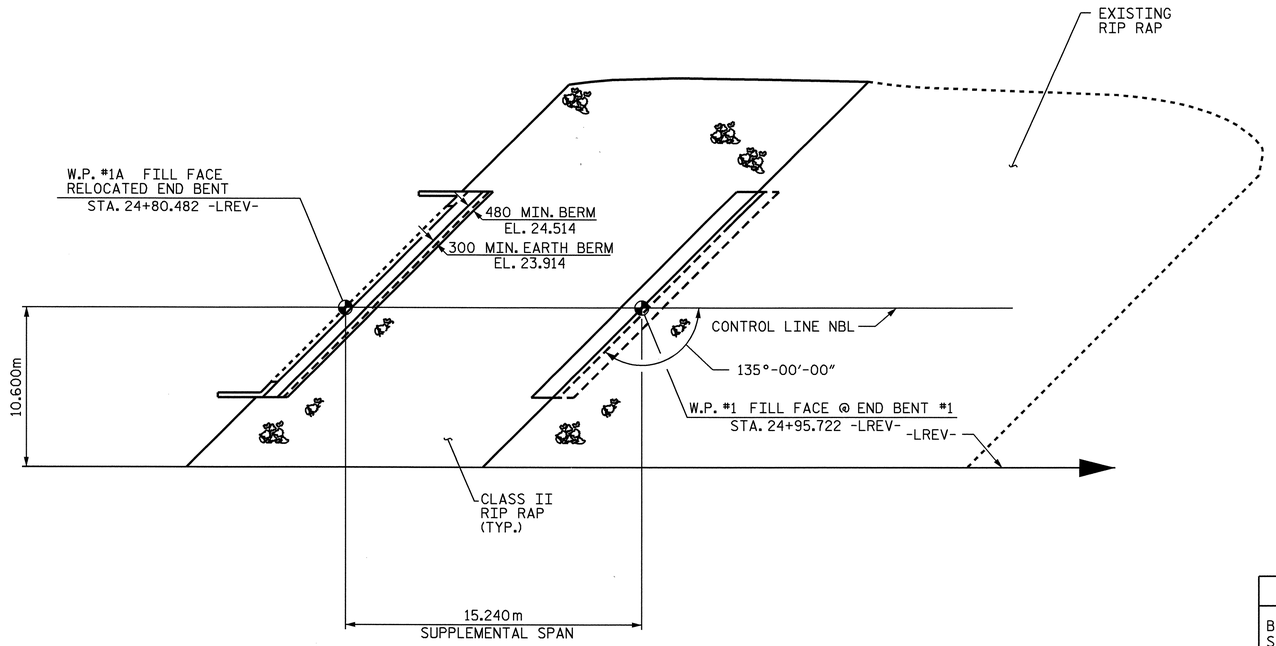
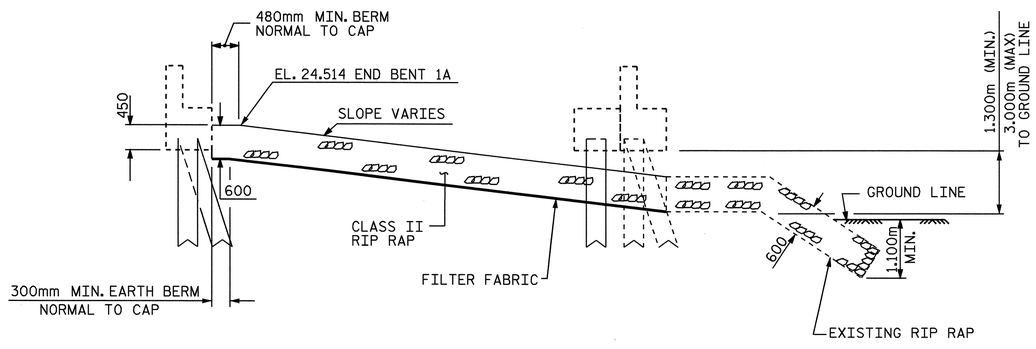


PLAN

ESTIMATED QUANTITIES		
BRIDGE @ STA. 25+36.132 -LREV-	PLAIN RIP RAP CLASS II	FILTER FABRIC FOR DRAINAGE
	METRIC TON	SQUARE METERS
END BENT 1	76	77



RELOCATED END BENT EXISTING END BENT

℄ SECTION
BERM RIP RAPPED

PROJECT NO. R-2562AC
CUMBERLAND COUNTY
STATION: 25+36.132 -LREV-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
RIP RAP DETAILS
(NBL)

ASSEMBLED BY : J.L. WALTON	DATE : 4/06
CHECKED BY : T.L. CLELLAND	DATE : 5/06
DRAWN BY : REK 1/84	REV. 7/17/98 REK/RWW
CHECKED BY : RDU 1/84	REV. 8/16/99 RWW/LES
	REV. 10/17/00 RWW/LES

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM R. DAVIS
11/3/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42
1			3			TOTAL SHEETS
2			4			44

02-NOV-2006 14:44
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tclelland

SKEW > 90°

STD. NO. RR3SM

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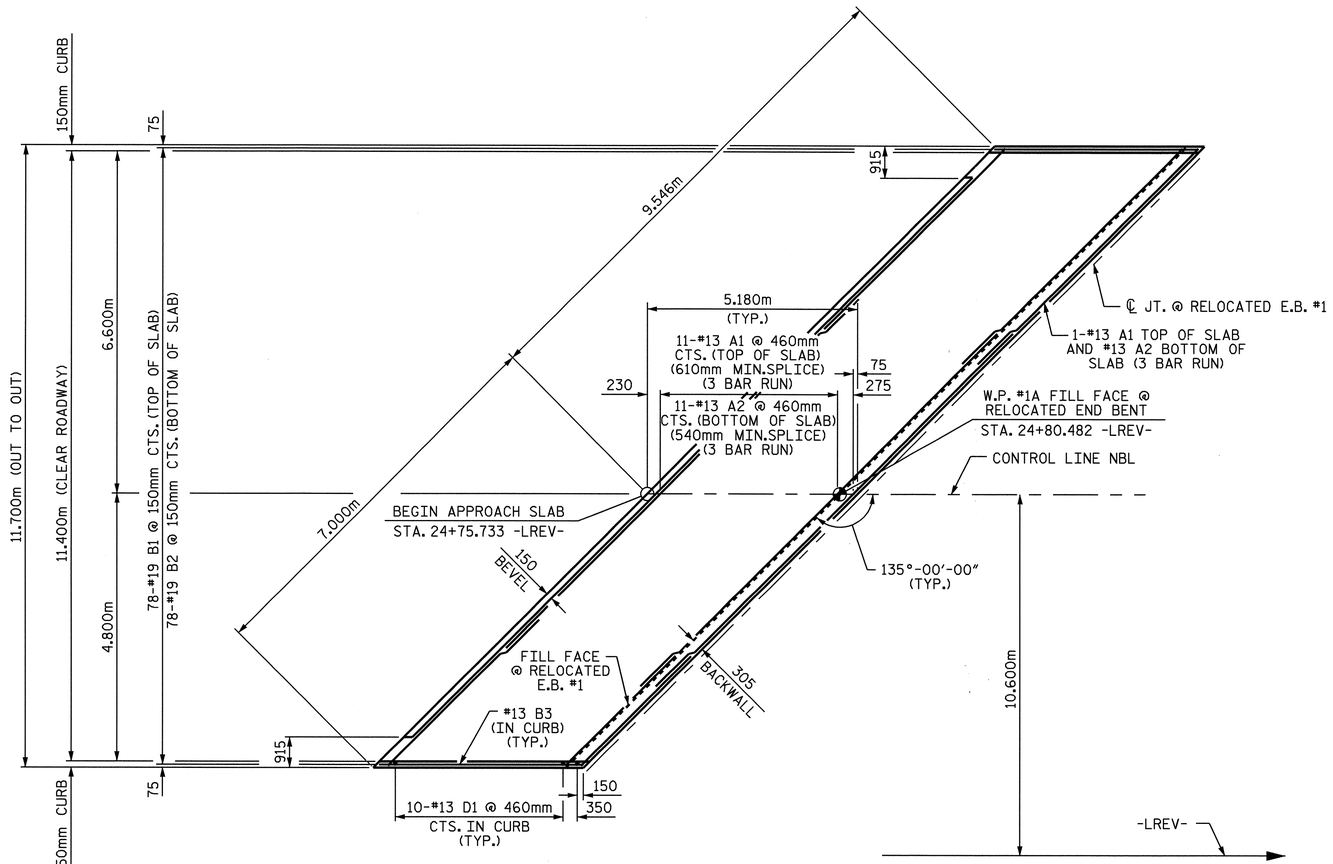
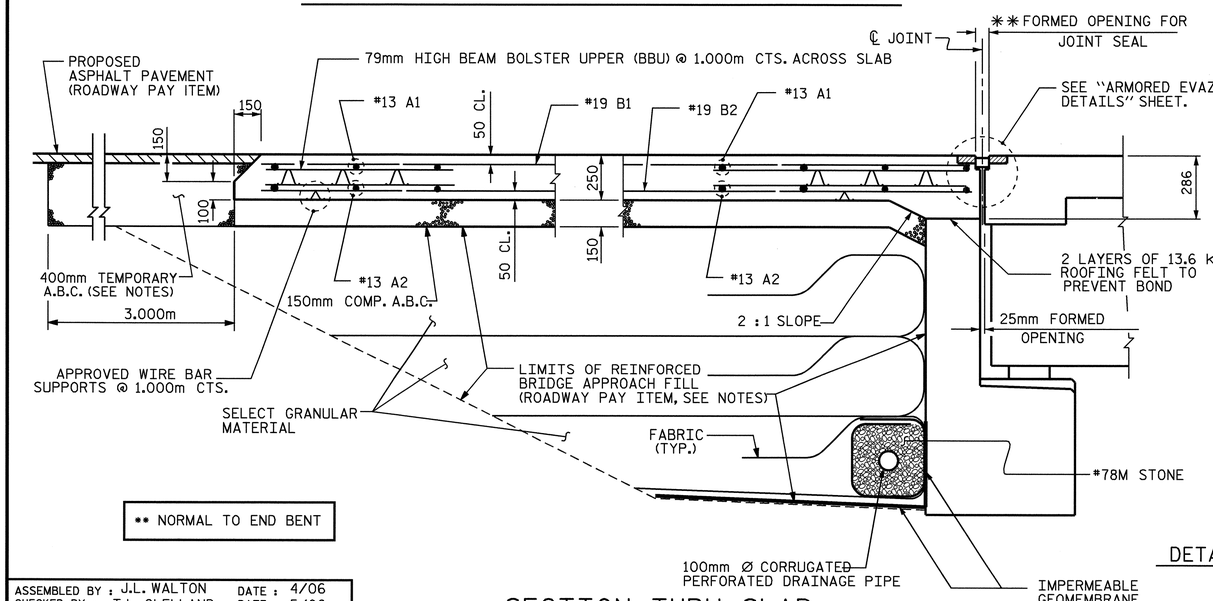
tclelland

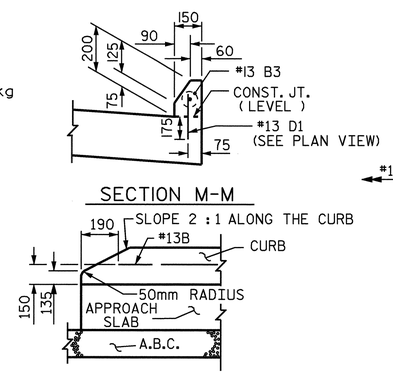


PLAN OF APPROACH SLAB @ E.B. #1



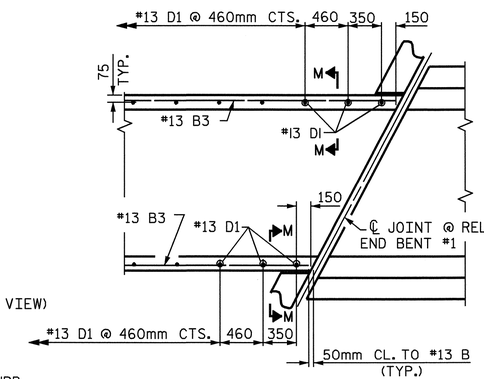
** NORMAL TO END BENT

SECTION THRU SLAB



DETAIL AT END OF CURB WITHOUT SPECIAL DRAINAGE

CURB DETAILS



PLAN

NOTES

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING FABRIC, IMPERMEABLE GEOMEMBRANE, 100mm Ø DRAINAGE PIPE, #78M STONE, AND SELECT GRANULAR FILL, SEE ROADWAY PLANS.

TEMPORARY DRAINAGE AND TEMPORARY BERM AND SLOPE DRAINS WILL BE PAID FOR UNDER THE LUMP SUM PRICE FOR BRIDGE APPROACH SLAB.

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE.

THE AREAS BETWEEN THE WINGWALLS AND THE APPROACH SLABS SHALL BE PAVED, SEE ROADWAY PLANS.

THE 150mm COMP. A.B.C. SHALL EXTEND 300mm OUTSIDE OF EACH EDGE OF THE SLAB.

THE CONTRACTOR MAY, AT HIS OPTION, USE EITHER 100mm TYPE HB ASPHALT CONCRETE BASE COURSE OR 125mm CLASS 'A' CONCRETE IN LIEU OF 150mm A.B.C. IF 125mm CLASS 'A' CONCRETE IS USED, THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 13.6 kg ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE WIDTH OF THE CONCRETE BASE SHALL BE THE SAME WIDTH AS THE APPROACH SLAB. THE APPROACH SLABS SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.

THE 400mm TEMPORARY A.B.C. SHALL EXTEND FROM THE END OF THE APPROACH SLAB TO 3m BEYOND THE SLAB AS SHOWN AND SHALL EXTEND TO EACH EDGE OF THE APPROACH SLAB. THE TEMPORARY A.B.C. MAY BE PLACED IN TWO LIFTS. EACH LIFT SHALL BE COMPACTED BY A MINIMUM OF TWO PASSES OF A VIBRATORY ROLLER

DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER THE SLAB HAS BEEN SCREEDED AND FLOAT FINISHED EXCEPT AS NOTED ON THE PLANS.

WITH EVAZOTE JOINT SEAL

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

PAYMENT FOR EVAZOTE JOINT SEALS SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR EVAZOTE JOINT SEALS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 64mm.

BILL OF MATERIAL

APPROACH SLAB @ E.B. #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	24	13	STR	8520	203
A2	24	13	STR	8480	202
✳B1	78	19	STR	4940	861
B2	78	19	STR	5080	886
✳B3	2	13	STR	4940	10
✳D1	22	13	STR	260	6
REINFORCING STEEL				kg	1088
EPOXY COATED REINFORCING STEEL				kg	1080
CLASS "AA" CONCRETE				m³	15.9

PROJECT NO. R-2562AC

CUMBERLAND COUNTY

STATION: 25+36.132 -LREV-

SHEET 1 OF 2

ASSEMBLED BY : J.L. WALTON DATE : 4/06
CHECKED BY : T.L. CLELLAND DATE : 5/06

DRAWN BY : EEM 3/95
CHECKED BY : VAP 3/95

REV. 6/16/95 EEM/RGW
REV. 2/6/97R EEM/RGW

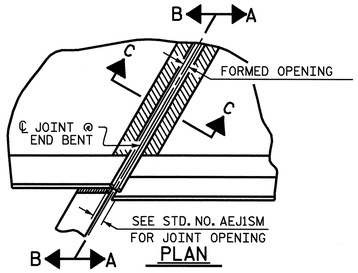
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT WITH REINFORCED BRIDGE APPROACH FILL (NBL)

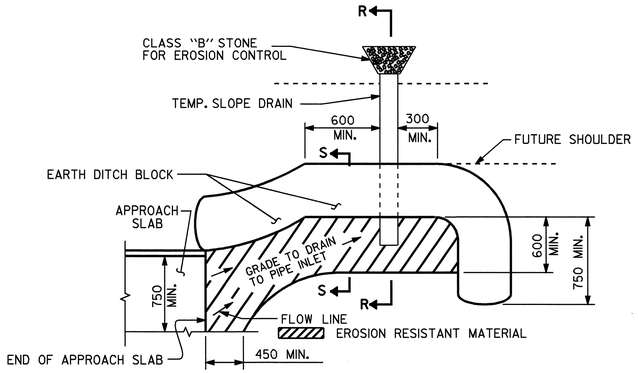
NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			44

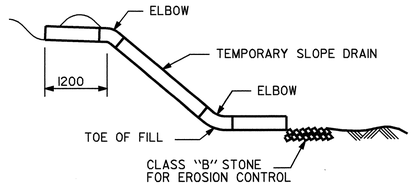
STD. NO. BAS3M



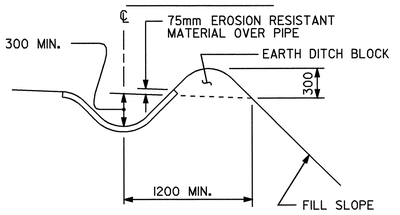
PLAN



NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE I OR TYPE 2, MIN. 50mm DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 305mm IN DIAMETER.



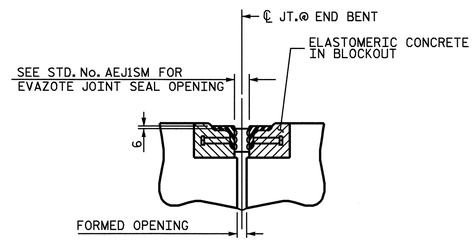
SECTION R-R



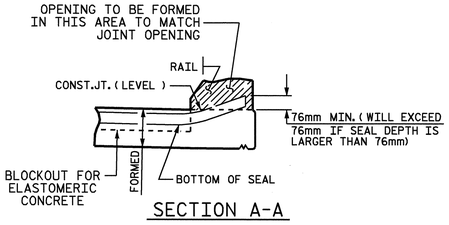
SECTION S-S

PLAN VIEW

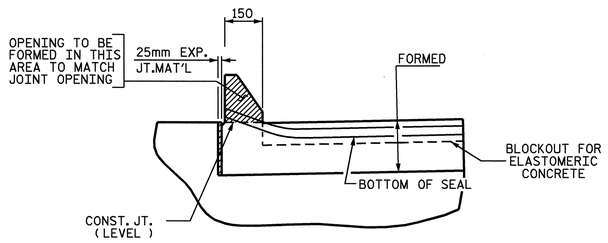
TEMPORARY BERM AND SLOPE DRAIN DETAILS



SECTION C-C
ARMORED EVAZOTE JOINT SEAL



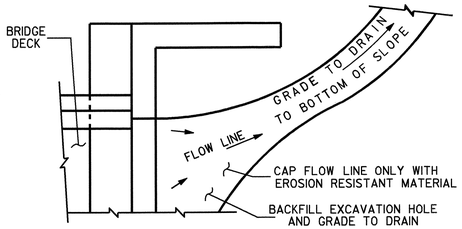
SECTION A-A



SECTION B-B

JOINT SEAL DETAILS @ END BENT

(FOR BARRIER RAIL)



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

TEMPORARY DRAINAGE DETAIL

PROJECT NO. R-2562AC

CUMBERLAND COUNTY

STATION: 25+36.132 -LREV-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
BRIDGE APPROACH SLAB DETAILS
(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 11905 ENGINEER WILLIAM A. DAVIS
4/3/06

ASSEMBLED BY : J.L. WALTON	DATE : 4/06	
CHECKED BY : T.L. CLELLAND	DATE : 5/06	
DRAWN BY : FCJ 11/88	REV. 5/16/97 EEM/RGW	
CHECKED BY : ARB 11/88		

STD. NO. BAS5SM

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF	
STRUCTURAL STEEL - AASHTO M270 GRADE 250	140 MPa
- AASHTO M270 GRADE 345W	190 MPa
- AASHTO M270 GRADE 345	190 MPa
REINFORCING STEEL IN TENSION	
GRADE 420	165 MPa
CONCRETE IN COMPRESSION	8.3 MPa
CONCRETE IN SHEAR	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR	
UNTREATED - EXTREME FIBER STRESS	12 MPa
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	2.6 MPa
EQUIVALENT FLUID PRESSURE OF EARTH	480 kg/m^3 (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2002 STANDARD SPECIFICATIONS "FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP; AND CLASS S SHALL BE USED FOR UNDERWATER FOOTING SEALS.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 19mm WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 38mm RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 6mm FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 6mm RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 300mm INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1 :2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 22.23mm Ø SHEAR STUDS FOR THE 19.05mm Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 -22.23mm Ø STUDS FOR 4 - 19.05mm Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 22.23mm Ø STUDS ALONG THE BEAM AS SHOWN FOR 19.05mm Ø STUDS BASED ON THE RATIO OF 3 - 22.23mm Ø STUDS FOR 4 - 19.05mm Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 610mm.

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 8mm IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 50mm OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

PLACEMENT OF BEAM OR GIRDER MEMBERS ON TRUCKS FOR HAULING SHALL BE DONE IN COMPLIANCE WITH LIMITS SHOWN ON SKETCHES PROVIDED TO THE MATERIALS AND TEST UNIT APPROVED BY THE STRUCTURE DESIGN UNIT DATED MAY 8, 1991. THESE SKETCHES PRIMARILY LIMIT THE UNSUPPORTED CANTILEVER LENGTH OF MEMBERS. WHEN THE CONTRACTOR WISHES TO PLACE MEMBERS ON TRUCKS NOT IN ACCORDANCE WITH THESE LIMITS, TO SHIP BY RAIL, TO ATTACH SHIPPING RESTRAINTS TO THE MEMBERS OR TO INVERT MEMBERS, HE SHALL SUBMIT A SKETCH FOR APPROVAL PRIOR TO SHIPPING. SEE ALSO ARTICLE 1072-1 1.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 2mm OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

METRIC

JANUARY, 1990